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*EVALUATION OF THE
NEW YORK STATE
PACS PROJECT
FINAL SYNTHESIS REPORT*

Contract No. 500-87-0030(3)


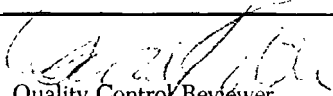
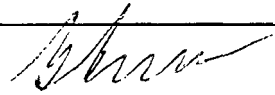
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EXECUTIVE SUMMARY

Under contract to the Health Care Financing Administration (**HCFA**), Abt Associates Inc. and its subcontractor the Urban Institute, evaluated the New York State Products of Ambulatory Care (**PACs**) payment system. Under a cooperative agreement with the HCFA, the New York State (**NYS**) Department of Health (**DOH**) designed the **PACs** case-mix classification system for non-surgical ambulatory care. NYS received a waiver to test the PAC classification system in nine demonstration hospital outpatient clinics and eight free-standing diagnostic and treatment health center clinics within the Rochester, Northeast New York, and New York City areas. While the classification system was developed for all payors, **PACs** became the basis for reimbursement only for Medicaid for demonstration facilities. The system became operational over an eight-month period beginning in December 1987.

The PAC Classification System

The **PACs** classification system includes a total of 24 clusters, each intended to represent an individual group of similar services provided to a similar group of patients.¹ The **PACs** system reflects patient classes, which describe similar patients with similar treatment patterns, and service categories, which reflect the type and principal purpose of the visit (e.g., diagnostic, therapy, well care, and problem management).

The PAC reimbursement methodology is based on a single, uniform, prospective price, with a **fixed** price for each PAC grouping. The PAC rate is determined from two components:

- Case-mix Related Direct Price, which reflects the average cost of **labor** and ancillary services for a given visit in a PAC; and
- Facility-Specific Average per Visit Cost, which reflects individual facility costs, including operational costs, teaching, pharmacy, and capital costs.

The PAC system applies to all mandated and optional services under Title XIX provided during a visit to an outpatient department or freestanding diagnostic and treatment center with the exception of: mental health services, drug treatment/detoxification services, dental

¹In 1992, NYS DOH expanded the number of PAC groups from 24 to 71, incorporating additional risk factors into the classification scheme.

services, dialysis services, ambulatory surgery², and emergency room services. Furthermore, only visits originating in a clinic within a hospital or visits to an eligible diagnostic and treatment center are subject to the PAC system. Visits to private physicians' offices and referred ambulatory visits to a hospital (e.g., for an X-ray) are not included under PACs. Restrictions limit the frequency with which certain PACs (e.g., well-care) can be billed during a calendar year. In addition, in order to bill for a diagnostic investigation visit, a prenatal visit which includes an ultrasound, or a visit with a CAT scan or nuclear medicine service, the facility must agree to be financially responsible for the high technology service.

Evaluation Objectives

The evaluation of the NYS PAC system had four major objectives:

- to assess the implementation and the operation of the PACs system;
- to analyze the impacts of the PACs system on practice patterns;
- to estimate the variation in resource use among and between the 24 PAC groups; and,
- to assess the applicability of the PAC system to the Medicare program.

Three separate efforts were undertaken to accomplish the above objectives:

- A case study of the implementation and operation of PACs;
- A quantitative analysis of the NYS PAC evaluation data to assess the impact of PACs on practice patterns and the usefulness of PACs as a classification tool; and,
- A simulation in which the PAC grouper is applied to a sample of Medicare claims to assess the potential for applying PACs to the Medicare program.

² NYS DOH implemented a separate classification system, the Products of Ambulatory Surgery, for ambulatory surgery services provided to Medicaid recipients.

Case Study Findings

Overall, demonstration facilities were able to implement the PAC system successfully. Facilities were able to collect the new data elements required to PAC a visit, apply the grouper software, and bundle relevant ancillary services with the appropriate visits.

Changes to the Medicaid claims forms were not necessary; however, several facilities redesigned their encounter forms to accommodate collection of the PAC assignment and evaluation data NYS DOH provided the PAC grouper to each demonstration facility. Most of the hospitals processed the claims and **PACed** the visits in-house, whereas most of the health centers contracted out for these data processing services. Changes required by the facility were dependent on the level of sophistication and flexibility of each facility's existing data processing system, including the degree of integration of the patient registration system, ancillary ordering procedures, and billing policies.

All demonstration sites assumed financial responsibility for ancillary services with minimal disruption to the provision or claims processing for these services. **Indeed**, vendors preferred to bill the facility for payment, rather than billing the state. Most of the hospital-based demonstration facilities performed these services in-house, whereas all the diagnostic and treatment centers contracted out for laboratory and **key** technology services. Demonstration facilities typically made arrangements with **existing** vendors for laboratory services. Formal arrangements were also negotiated with providers of key technology services (e.g., radiologists). The payment was generally based on a global fee and was similar to the payment level previously reimbursed under Medicaid. However, while demonstration facilities established procedures for identifying whether the test was related to a PAC-reimbursed visit, facilities did not appear to monitor vendors closely to determine whether duplicate billing was occurring.

Interviews with clinical staff indicated that **PACs** had virtually no impact on the quality of care provided to patients. Physicians and nurses were typically unaware of the **PAC** system and did not notice any changes in visit patterns, visit length, ancillary ordering, or **case-mix** among patients. The analysis of the PAC evaluation data suggests that changes did occur during the time that **PACs** was implemented, but it is impossible to determine from available data whether these changes are attributable to **PACs**.

Interviews with administrative staff in each facility indicated that **PACs** was purely an administrative process, affecting a small portion of total outpatient activity in each facility. In addition, due to the small number of classification groups, staff reported that there was limited ability to "game" the system by "upcoding". Administrators acknowledged the potential of using information collected under the **PACs** system as a management tool, but none of the demonstration facilities participating in the case study had performed any analysis of the **PACs** data.

PACs Data Analysis

A sample from the approximately 1.5 million visit-level evaluation database compiled by the NYS DOH was extracted for analysis. Data were available for only 13 of the 17 demonstration facilities. In addition, there was limited data representing the period prior to PAC implementation (about 1 to 2 months). The post period data reflected about 1-2 years under PACs. The sample was stratified by PAC group, date of PAC implementation, and facility. Close of 58,000 visits resulted from this stratification scheme, 60 percent of which represents visits to hospital outpatient departments and the remainder representing visits to diagnostic and treatment centers.

Two primary questions were addressed in this analysis: 1) what were the impacts of PACs on practice patterns, including ancillary service utilization and staff use?; and 2) how well do the 24 PAC groups explain the variation in resource use across patients?

The analysis on the effect of PACs on service provision suggests that some significant changes occurred in the **period after** PAC implementation. Use of ancillary services, particularly "key technology" services (e.g., imaging procedures), increased substantially between the pre- and post-time periods. Primary care physicians also assumed a larger role in the provision of care, while the importance of both specialist physicians and non-physician personnel diminished. In addition, these changes in provider behavior was not limited to the provision of services to Medicaid patients, but affected all payors. Unfortunately, given the lack of adequate control sites with which demonstration facilities behavior can be compared, it is impossible to determine whether changes in demonstration provider behavior should be attributed to the institution of PACs or to other forces.

Like any useful classification system, PACs were designed to maximize the homogeneity of resource use (labor and ancillary costs) within each PAC while assuring differences across PACs. There is considerable variation in the homogeneity of different PACs, primarily due to the variation in usage of ancillary services. High cost, diagnostic PACs appear to exhibit the least amount of internal variation, while the management PACs are less consistent. In general, PAC system performs reasonably well in classifying patients. In particular, PACs explain about two thirds of the variation in total costs. However, these findings be considered cautiously. The manner in which costs were measured by the NYS DOH (e.g., broad intervals for provider time, a fixed fee schedule for ancillary costs) artificially reduces the variation in costs. It is also important that a classification system maintain the distinction among its groups, otherwise multiple categories could be collapsed without sacrificing substantial internal consistency. For the most part, the data suggest that the PAC groups are relatively distinct.

Applicability of the PAC System to Medicare

Five criteria were used to examine the issue of whether the PAC system could be used with the Medicare program: administrative simplicity, appropriateness, reduction in variance, and stability and the absence of undesirable provider incentives:

- Administrative simplicity: The bundled payment for both facility and physician components under PACs would require substantial administrative changes for Medicare which reimburses for technical and professional services separately using totally different billing systems. In addition, additional data elements would need to be added to the Medicare outpatient bills in order to PAC each visit and to ensure accurate bundling of services.
- Appropriateness: While the PAC groups categorized Medicare services relatively well, not all the 24 groups were useful. In particular, 10 PAC groups accounted for more than 97 percent of all Medicare claims.
- Reduction in variance: Based on an analysis of coefficients of variation, there would have to be some refinement of selected PACs for the application to the Medicare program. Overall, the PAC system was found to explain approximately 24 percent of observed variation in outpatient costs, well below the level of variation explained when the system was applied to demonstration patients of all ages in New York State.
- Stability and provider incentives: While not tested empirically with Medicare data, the incentives under PACs to “game” the system is clearly evident. Patients could potentially be moved from the management to the diagnostic PACs (by providing key technology services. Further, depending on the reimbursement level of services not eligible for RAC reimbursement (e.g., referred ambulatory services), the incentive to shift the locus of care exists. These incentives might affect the size of clinics and willingness to accept referred ancillary services. Thus, the reimbursement levels for a PAC Medicare system would have to be set carefully.

Conclusions and Lessons Learned

The New York State Department of Health undertook an ambitious and potentially valuable project in attempting to devise a payment system that bundles provider and facility costs into a single prospectively-determined fee. The State appears to have designed a system that classifies visits reasonably well relative to resource use, and the demonstration facilities were able to incorporate the PACs system into their administrative structure. While the administrative experiences of the demonstration facilities suggest that PACs can be implemented on a broader basis, the facilities acknowledged that reimbursement under PACs affected only a small proportion of their revenue.

The analysis of the PACs evaluation database suggest that changes in ancillary utilization and staff use did occur during the time period that PACs was implemented. However, it is unclear whether any of these trends are attributable to the demonstration since no control data existed for comparison purposes. In addition, the PAC grouping algorithm explains a high proportion of the variation in costs across New York State demonstration providers. However, if PACs were applied to other populations, it would probably be necessary to modify the classification system to reflect the underlying differences in patient characteristics and risk factors (e.g, consolidate and/or expand the PAC groupings).

The State may want to consider several changes to the PAC grouping and implementation. For example, the pricing of the time component is imprecise, making it difficult to determine the level of importance that staff time contributes to variation in resource use. In addition, demonstration providers expressed interest in obtaining feedback from the State summarizing findings from the evaluation data submitted by each facility, particularly related to comparing performance under PACs to their peers.

There are several issues that must be considered in assessing whether PACs is applicable to the Medicare system. In particular, the administrative changes required to the Medicare billing system to accommodate a bundled payment approach are not trivial. Further, several new data elements would be required to PAC each visit. Similarly, the PAC grouping would have to be modified to reflect the characteristics and risk factors of the Medicare population. Finally, the PAC rate would have to be set to as to minimize provider incentives to provide unnecessary ancillary services.

CHAPTER 1

INTRODUCTION

The Products of Ambulatory Care (PACs) payment system bundles together related medical services typically received by specific types of patients. It incorporates all labor and ancillary services related to a single visit into a single prospectively-determined fee. Reimbursement under PACs includes both the physician and facility costs associated with a given visit. Under a cooperative agreement with the Health Care Financing Administration (HCFA), the New York State (NYS) Department of Health (DOH) designed the PACs case-mix classification system for non-surgical ambulatory care. NYS received a waiver to test the PAC classification system in nine demonstration hospital outpatient clinics and eight free-standing health center clinics within the Rochester, Northeast New York, and New York City areas. These ambulatory care programs represent about 11 percent of all Medicaid visits and 12 percent of all ambulatory care visits occurring in New York.¹ Facilities were phased into the PACs system over an eight month period beginning in December 1987. PACs became the basis for reimbursing all demonstration facilities for Medicaid visits during 1988.

PAC Classification Matrix

NYS DOH used several parameters in designing an ambulatory care service classification scheme. The system was required to be:

- clinically meaningful;
- administratively simple;
- transparent to providers and patients;
- based on routinely available data; and
- adaptable to a reimbursement methodology.

The classification system includes a total of 24 clusters, each intended to represent an individual

¹Report to the Legislature, March 31, 1989. New York State Department of Health, Office of Health Systems Management.

group of similar services provided to a generally similar group of patients.* As a result, the PACs system is based on two clusters of characteristics:

- Patient Classes which describe similar patients with similar treatment patterns.
- Service Categories which reflect the continuum of ambulatory care, from problem assessment and diagnosis, through treatment planning, intervention and management to follow-up and referral.

The Patient Classes represent a grouping scheme that categorizes patients according to their diagnosis and treatment characteristics. Patient diagnoses were initially grouped into 24 “clinically meaningful” Diagnostic Service Clusters (DSCs) according to similar ICD9-CM diagnosis codes and generally classified according to the affected body system. Some of the DSCs were subsequently combined according to similarities in treatment and other patient characteristics, resulting in 10 **final** patient category groups. Thus, patients with similar diagnoses and patient characteristics are grouped into one of ten distinguishable Patient Classes.

Four Service Categories were developed to reflect similar resources required at different stages of the ambulatory visit to treat the patient condition:

Diagnostic Investigation: Visits under this category are usually the **first phase** of medical care and involve the initial identification of the patient’s condition. For this reason, the provider may require more contact time with the patient as well as more ancillaries (e.g., laboratory testing) until the proper diagnosis is made. This service category includes the presence of ‘key technology’ services: CAT scans, nuclear imaging, stress tests, X-rays, **EEGs**, ultrasounds, chest X-rays, mammograms, and contrasts.

Therapy Management: Visits in which the actual treatment or therapy regimen is administered (based upon the diagnosis) are included in this category, including immunizations and medication. Provider contact time and ancillary use depend on the extent and frequency of treatment.

Problem Management: This category identifies visits in which progress and/or follow-up is conducted. These visits assess the patient’s condition and allow the

²In 1992, NYS DOH expanded the number of PAC groups from 24 to 71, incorporating additional risk factors into the classification scheme. Review of the impact of this modification is beyond the scope of this evaluation.

provider to modify or abandon any existing treatment if necessary. These visits require average provider contact time and often less laboratory testing. However, key technologies can be used.

Well Care: Visits for routine check-ups are included in this category. These visits are not initiated by health problems and can involve more ancillary use due to the different well care examination protocols.

The combination of the Patient Classes and the Service Categories results in a classification matrix reflecting differences in patient characteristics and the type of visit. As shown in Exhibit 1, 24 mutually exclusive PACs were developed from these patient classes and service categories. The classification matrix utilizes slightly over half of the available 40 PAC cells (10 patient classes and 4 service categories).

PAC assignment is performed by a computer algorithm based on 9 variables:

- Primary diagnosis
- Secondary diagnosis
- Age
- Sex
- Provider type (e.g., audiologist)
- Clinic type (e.g., ophthalmology)
- Visit type (old/new patient)
- Administration of drugs
- Ancillary tests provided

Reimbursement **Methodology**

Two objectives guided the development of a reimbursement methodology:

- the methodology must be applicable to both hospitals and diagnostic and treatment centers; and
- comparable costs must be included in the same cost centers, regardless of facility type.

The PAC reimbursement methodology is based on a single, uniform, prospective price for all demonstration facilities with a **fixed** price established for each PAC. The PAC rate is determined from two components:

Exhibit 1

Products of Ambulatory Care Classification Matrix

Patient Classes		Diagnostic Investigation	Therapies	Problem Management	Well Care
	Class I	Class I diagnostic examination PAC #3		Class I management PAC #4	Child well care PACs #1 & 2
	Class II	Class II diagnostic examination PAC #7		Class II management PAC #8	Adult well care PAC #6
	Pregnant Women	1st visit prenatal PAC #9		Prenatal I PAC #10	Prenatal II PAC #11
	Reproductive Care	Reproductive diagnostic examination PAC #13		Reproductive management PAC #14	Routine gynecological examination PAC #12
	Class III	Class III diagnostic examination PAC #15		Class III management PAC #16	
	Class IV	Class IV diagnostic examination PAC #17	Chemotherapy/ Radiotherapy PAC #18	Class IV management	
	Class V		Class V Therapy PAC #20		
	Any Patient	Diagnostic examination with NUC, CAT PAC #24	Medication Administration PAC #5		
	Speech and Rehabilitation	Audio examination PAC #21	Speech and Rehabilitation PAC #23		
	Ophthalmology	Ophthalmology diagnostic PAC #22			
		Service Categories			

- Case-mix Related Direct Price, which reflects the average cost of labor and ancillary services for a given visit in a PAC.
- Facility-Specific Average Per Visit Cost, which reflects individual facility costs, including operational costs, teaching, pharmacy, and capital costs.

The total PAC reimbursement is based on the sum of the case-mix related direct price (the mean ancillary service price and the labor price) and the facility-specific component. An inflation factor is also applied to adjust for current year prices.

Covered Services and Restrictions

The PACs system applies to certain services covered by Medicaid. In addition, there are some restrictions on frequency of billing for specific types of visits. The PAC classification scheme³ covers all mandated and optional services under Title XIX provided during a visit to an outpatient department or freestanding diagnostic and treatment center with the exception of: mental health services delivered in mental health clinics, drug treatment/detoxification services delivered in certified drug treatment programs, dental services, dialysis services, ambulatory surgery, and emergency room services.³ DOH excluded these services because their service profiles (e.g., utilization, costs) tends to be very different than those services captured by the PAC system.

Furthermore, only visits originating in a clinic within a hospital or visits to an eligible diagnostic and treatment center are subject to the PAC system. Visits to a private physician's office are not included under PACs. Similarly, referred ambulatory visits to a hospital (e.g., a private physician sends a patient to the hospital for X-rays) are not included.

Prior to PACs, hospitals and freestanding clinics could only bill Medicaid for one clinic visit per recipient per day. Under PACs, this restriction was partially lifted. Facilities are allowed to bill a maximum of two clinic visits per recipient per day provided that only one of the visits is covered by the PAC reimbursement system and the second visit is for a non-

³Over 70 percent of the ambulatory care visits in New York State are subject to the PAC methodology. New York State Ambulatory Care Initiatives, Report to the Legislature, New York State Department of Health, Office of Health Management Systems, March 31, 1990.

covered service. Facilities are not allowed to bill for two PAC-reimbursable visits, nor for two non-covered services on the same day.⁴

In order to bill for a diagnostic investigation visit, a prenatal visit with ultrasound, or a visit with a CAT scan or nuclear medicine service, the facility must agree to be financially responsible for these key technology services. A facility can participate in the demonstration if it chooses not to be financially responsible for key technologies; however, it will not be eligible to bill the PACs related to the service.

Evaluation

Abt Associates Inc., with its subcontractor, the Urban Institute, evaluated the design and implementation of the PACs system on a demonstration basis in New York for HCFA. This evaluation has been comprised of three major efforts:

- Site visits were made to eight of the 17 demonstration facilities and NYS DOH staff involved in the design and implementation of the PACs demonstration were interviewed on several occasions; findings from these visits and interviews form the basis of a case study report;
- Data were received on the types and cost of labor and ancillary services used in each visit (to patients covered by all payors) provided by demonstration sites; these data were used to assess the impact of the PAC system on practice patterns as well as the usefulness of PACs as a classification tool;
- The PACs grouper was applied to a sample of Medicare claims to appraise the potential for applying PACs to the Medicare program.

This report summarizes and synthesizes our conclusions from each evaluation task. Previous reports submitted to HCFA have described in detail our findings from the case study site visits and from the analysis of Medicare data. Therefore, discussion on these topics is limited to a summary of the key findings and the full reports are attached as appendices. Results from analysis of New York State evaluation data are described in full. Chapter 2 summarizes

⁴Visits that result in a direct inpatient admission can only be billed for the inpatient stay and are not eligible for reimbursement for the clinic visit. This was true prior to PACs as well.

the key findings from the case study effort. Chapter 3 presents the results from the analysis of the PAC evaluation data, including the impacts on ancillary and staff utilization and the variation in resource use between and among the 24 **PACs**. Chapter 4 summarizes the results of applying the PAC grouper to a sample of Medicare claims and discusses the applicability of **PACs** to the Medicare system. Finally, the report concludes in Chapter 5 with a synthesis of lessons learned from these three evaluation efforts.

CHAPTER 2

FINDINGS FROM THE CASE STUDY

The Abt Associates' report, Case Study of **PACs** Implementation, attached as Appendix 1, examined the implementation of the **PACs** in New York State.⁵ The case study report is a qualitative examination of the state and demonstration facility efforts in the development and implementation of the **PACs** classification scheme and reimbursement methodology. Abt staff conducted personal interviews with NYS DOH staff responsible for the development and maintenance of the PAC system, and attended several advisory group meetings in which ongoing development and implementation issues were discussed. In addition, site visits to five of nine demonstration hospitals and three of eight demonstration community health centers were conducted in the winter and spring of 1990. Given the timing of these site visits, facilities had at least one and a half years of implementation and operational experience under the PAC reimbursement system when they were visited. Administrative staff interviewed at demonstration sites included ambulatory care managers, clinic administrators, accounting or financial managers, and staff from a variety of departments, including medical records, data processing, and ancillary services. Clinical staff, typically the medical directors and nursing supervisors, were also interviewed. Interviews focused on the **PACs** implementation process and its impact on the delivery of ambulatory services in each facility. A full description of the development and implementation efforts of the PAC system, as well as findings from the interviews, were presented in the case study report. Three aspects of the impacts of the PAC system, as described by State and facility staff, are summarized below:

- administrative feasibility;
- perceptions of the impact on quality of care;
- perceived ability to "game" the system.

⁵The case study was based on the PAC classification in effect from 1987-1990. In 1992, NYS DOH expanded the number of PAC groups from 24 to 71, incorporating additional risk factors into the classification scheme.

Administrative i l i t y

In order to participate in the demonstration, facilities had to agree to three conditions: 1) collect specific data elements; 2) establish financial responsibility for ancillary service; and, 3) bundle and match all ancillary services with a given visit. The amount of effort required to meet these conditions is discussed below.

Data collection. As a condition of participation in the PAC demonstration, facilities were required to collect data needed for the PAC grouper software and to collect additional data elements required for the PAC evaluation. Prior to the demonstration, many facilities recorded several of the variables required for PAC assignment on ambulatory clinic encounter forms. For example, patient demographic characteristics and diagnostic information were often collected on these forms, with the latter often in a pre-coded format. However, other information required for PAC assignment was not necessarily included on encounter forms or was on the form but-not in the coding scheme required by DOH, particularly elements such as ancillary tests provided, provider type, and clinic type. Most data elements required for evaluation purposes were not typically captured on encounter forms as well.

As a result, one of the first tasks undertaken by demonstration facilities was an analysis of their information flow. Changes had to be made to the data collection activities for all eight of the, case study demonstration facilities. Five of the eight facilities completely redesigned their encounter forms to accommodate collection of the PAC assignment and evaluation data.. This process usually required at least a month, and in some cases three months, to complete. Other facilities simply attached an addendum to each encounter form to collect the data elements that were not already part of their form.

No changes were necessary in the Medicaid claims forms, as the existing claims forms were used to bill Medicaid for visits under PACs. The only change relating to the claims forms was substitution of a new master list of rate codes for each PAC for the old Medicaid visit rate code. The data processing vendor for NYS updated the existing billing system in each demonstration facility with a new set of PAC rate tables as part of a routine system update.

Establishing financial responsibility for ancillary services. Because PAC rates are all-inclusive, a second condition of participation stated that the provider be financially

responsible for all non-key technology **services**⁶ (laboratory tests and simple **EKGs**) that are provided to Medicaid patients, regardless of whether the facility had the capability or equipment to provide the service. The facility had the option of specifying which of the nine key technology services it would agree to provide under the demonstration. All 17 demonstration facilities chose to be financially responsible for all key technology services.

With one exception, all of the hospital-based demonstration sites involved in the case study performed laboratory and key technology services in-house. However, in some cases, the physician or physician group responsible for interpreting the test results (e.g., radiologists), particularly for key technology services, were not salaried hospital staff. As a result, the hospital and physician(s) made arrangements for the professional fees to be billed directly to the hospital, instead of Medicaid. This arrangement was often preferred by the physician(s), allowing them to avoid the paperwork involved in billing the state and often reduced the delay in payment.

All diagnostic and treatment centers involved in the case study, on the other hand, contracted out for laboratory, as well as key technology services. For the most part, demonstration facilities made arrangements with existing vendors for laboratory services. Formal arrangements were also negotiated to provide key technology services. The payment was generally based on a global fee (technical and professional) and was similar to the payment level previously reimbursed under Medicaid.

One problem associated with this condition of participation was that outside vendors providing laboratory and key technology services were responsible for reviewing each test/procedure order to determine whether the test or procedure should be billed to Medicaid or to the demonstration facility. If the test or procedure was ordered for an ambulatory surgery or emergency room visit not covered by the **PACs** program, it would be billed directly to Medicaid. As a result, demonstration facilities established procedures for identifying whether the test was related to a PAC-reimbursed visit. However, facilities were unable to report what

⁶Key technology services include chest x-rays, x-rays with contrast, mammograms, **EEGs**, **CT** scans, **MRIs**, cardiac stress testing and ultrasounds. Provision of a key technology service generally results in higher reimbursement.

measures were used to ensure that the vendors were not billing Medicaid and therefore avoid duplicate billing.

Bundling/matching all ancillary services with a visit. The last condition of participation stated that a facility must confirm the provision of key technologies prior to processing a visit through the PAC grouper software. The provision (or non-provision) of key technology services directly influenced PAC assignment and reimbursement. Because services considered to be key technology services under PACs can be provided days, if not weeks, after the originating visit, facilities were faced with two problems: matching the ancillary service to the visit and changing billing procedures so that billing occurred after the confirmation of the ancillary service based on receipt of lab/procedure results.

The ease with which a facility could bundle all related ancillary services was highly dependent on the type of ID, or account number, assigned to individual patients and visits. The simplest and most frequently used identification system was the visit-based approach in which a separate ID was assigned with the visit, regardless of whether the ancillary service was provided on the same day as the visit. Matching ancillaries to visits was not required under this system, since by definition, all ancillary services already had the same ID number assigned to them as the originating visit. Other ID systems, such as the patient-based system where a unique patient ID is used for all visits and ancillaries regardless of visit date, or the service-based system, where a different ID is assigned for each date of service, required considerable effort from data processing personnel to match visits with provided ancillaries.

For billing purposes, all but one facility held accounts open until receipt of lab/procedure results. Visits for which a key technology or other ancillary service was ordered were held open (suspended from billing) for a set period of time ranging from two weeks to three months across facilities to await reporting of the test result. Once reported, the service was matched with the visit and the account was closed for billing. Given that suspended claims affect cash flow, several facilities concentrated their efforts primarily on visits with key technology services, which assign the visit into a higher reimbursed PAC. One facility did not hold accounts open to confirm the provision of ancillary services. Instead, all visits were billed directly to the state during its normal bi-weekly cycle, allowing the facility to receive partial

payment. Every quarter, a "sweep" of all Medicaid claims was performed to match all ancillary services with the appropriate visit, resulting in about 5 to 10 percent of the claims being submitted to the State for adjustment.

PAC Grouper Software:

Facilities were also responsible for assigning visits to a PAC group in order to bill for services provided. DOH provided the grouper software to each facility and therefore had to make the PAC grouper easily adaptable to both hospital and health center settings. The output was also required to be in a standard format for a database that would be used to evaluate the classification scheme and recalibrate the pricing structure. It became clear that two grouper programs were required. One program was written in COBOL for application to mainframe computer systems, typically for use in hospitals; another program was written in BASIC for application on an IBM personal computer, often used in health centers. If a facility's data systems were not compatible with either the COBOL or BASIC PAC groupers, DOH provided a tape/disk or a hard copy of the PAC grouper for modification and incorporation into the facility's system. Most of the hospitals processed the claims in-house, whereas most of the health centers contracted out for these data processing activities.

Each of the requirements for participation had the potential to affect one or more operational areas within the facility, particularly patient registration and processing of encounter information, vendor relations, billing policies, and data processing. Changes required by the facility were dependent on the level of sophistication and flexibility of each facility's existing data processing system, including the degree of integration of the patient registration system, ancillary ordering procedures, and billing policies into the management information system. Most facilities added, or reassigned, staff to accomplish the tasks required to implement PACs. Several facilities added data entry clerks who also assisted in matching visits and ancillary services.

As an incentive to participate, DOH included a hold harmless provision in the demonstration design so as to minimize the risks, in terms of facility start-up and maintenance outlays, of participation. Through May of 1990, only 5 of the 17 demonstration facilities submitted hold harmless reports to DOH, and all five were diagnostic and treatment centers.

Reported costs for implementing PACs ranged from about 45 to 351 thousand dollars. Four of the five D&Ts reported over a third or more of the additional expenses to be in labor, particularly for billing clerks and data entry personnel. Two facilities reported about forty percent of the additional expenses to be for computer hardware and software. Another two facilities reported over half of the additional expenses for purchased services by outside vendors, particularly for laboratory and key technology services. DOH adjusted PAC rates for those facilities that, as determined by DOH, incurred a loss.

Perceived Impacts on Quality of Care

Assessment of the impact of the PAC system on the quality of care delivered to patients by demonstration providers was beyond the scope of the evaluation. However, interviews with clinical staff at demonstration sites suggested a striking absence of any impact on patients or effect on providers in the clinic setting. In interviews with clinical staff, the case study team found only a few clinicians aware of the definition of the term "PACs", much less any of the related terminology (e.g. "key technology"). The clinicians' only acknowledgement of recent changes related to the new data elements they were required to complete on the encounter form, most of which were for evaluation purposes, not for PAC assignment. Most clinicians did not feel that the new requirements for completing the encounter form were burdensome or time consuming.

Interviews with physicians and nurses suggested no changes associated with PAC implementation in visit patterns, visit length, ancillary ordering, or case-mix among patients. Nor did the clinical staff identify any impacts on patients. Based on these interviews, one can conclude that NYS DOH did indeed meet its objective in designing a reimbursement system that is transparent, or virtually invisible, to the provider and patient. However, while these interviews suggest that the PAC system had no impact on practice patterns, our data analysis, described in the next chapter, examines the question more rigorously.

Perceived Ability to "Game" the System

Case study interviews found that facilities were skeptical about their ability to maximize revenues under PACs. Unlike DRGs, the small number of classification groups did

not create significant potential to “game” the system by “upcoding”. Each PAC is sufficiently distinct that classification is generally unambiguous. Similarly, because Medicaid patients represented only a small percentage (about 10 percent) of total outpatient activity in each facility, payment for their care did not warrant significant attention by the financial administration to identify ways to increase revenue under PACs.⁷

Summary

Overall, it appears that demonstration sites implemented the administrative aspects of the PACs reimbursement system in their facilities successfully. Facilities were able to collect the necessary data, apply the grouper software, and bundle ancillary services with the appropriate visits. Recent changes to the PAC grouper methodology that require fewer data elements should make implementation even easier.

Both clinicians and administrators feel that the PACs system is largely an administrative process with few implications for clinical practice patterns or quality of care. Administrators acknowledged the potential usefulness of information collected under the PACs system as a management tool but none had implemented any analysis of the PACs data.

⁷A discussion of the “gameability” of the PAC system contained in the Urban Institute (UI) report also suggests that since each PAC group is defined by relatively broad body system categories, and because the number of PAC groups is small, the ability to move across PACs by patient class is limited. However, the UI report adds that within patient class groups, it would be relatively easy to move from a management PAC to a diagnostic PAC simply by providing one of the key technology procedures. The report concludes that the rate structure must be carefully set so that providers do not have an incentive to provide unnecessary ancillary services in order to change a PAC group assignment. In addition, the requirement that all ancillary services related to a visit must be bundled into the PAC claim should be strictly enforced so that providers do not game the system by billing for a visit under PAC reimbursement and billing for related ancillaries under a fee schedule.

CHAPTER 3

FINDINGS FROM THE PACS DATA ANALYSIS

This chapter presents results of an analysis of a sample of claims from 13 of the 17 demonstration facilities participating in the New York State PAC Demonstration.

In this analysis, we address two fundamental issues. First, did implementation of PACs cause changes in practice patterns -- either in the provision of various ancillary services or through changes in usage of different types of providers? Second, do the 24 categories of non-surgical ambulatory care patients created by the PAC system explain a substantial portion of the variation in resource use across patients in an efficient manner? Both simple descriptive statistics and the results of multiple regression analysis addressing each question are described below.

In the next section we describe the initial data set, modifications made to it, and the sample drawn for analysis. The next section discusses our findings regarding changes in practice patterns. We then examine the PAC system for intra- and inter-PAC homogeneity. The final section summarizes the findings.

Data Set and Sample Frame

Data Limitations

The New York State Department of Health provided the data used for this analysis. The evaluation data set is composed of approximately 1.5 million visit-level records from 13 of the 17 demonstration facilities covering the period from August, 1987 through March, 1990. However, because each demonstration facility implemented the PAC system on different dates, the pre and post demonstration periods are defined uniquely for each facility. As a result, data are available for a limited time prior to PAC implementation, generally representing only 1-2 months prior to each facility's "start" date. In addition, the evaluation data set

*Analyses are based on all payors. Regressions indicated that there were no significant differences in practice patterns or PAC homogeneity between Medicaid and non-Medicaid patients.

did not have any observations for two facilities in the pre period. The post period generally covers one to two years of PAC experience for each facility.

The type of evaluation data collected by the New York State Department of Health includes information that is generally recorded on each facility's encounter form (e.g., demographic information, ancillary utilization, etc.). In addition, as described in our case study report,⁹ several other variables are required in order to appropriately assign the visit to a given PAC. However, the reliability of several variables in the evaluation data set is somewhat questionable.

In particular, the reliability of the patient's primary **payor** is based on the method of data collection by demonstration facilities. Demonstration facility staff were instructed by the NYS DOH to record- the patient's Medicare health insurance claim (**HIC**) number in the same field as the patient's social security number (with the HIC taking precedence). As a result, to determine primary **payor**, we had to distinguish between valid HIC numbers and valid social security numbers. This can be difficult because the first nine digits of a **HIC** number are typically the digits of an individual's social security number. A valid **HIC** number for patients covered by Medicare must be 11 characters, the first 9 of which must be numeric, and the last 2 being alpha or alpha-numeric.

For our analysis, two assumptions were used to distinguish **HIC** numbers from social security numbers: 1) a **HIC** number must start with 9 numeric digits; and 2) the last two digits of a **HIC** number must be composed of valid alpha-numeric combinations. Based on these assumptions, about 10 percent of the sample had valid Medicare **HIC** numbers, half of which included Medicare beneficiaries covered by Medicaid (i.e., crossovers).

Similarly, we had to distinguish valid Medicaid ID's from invalid Medicaid ID's. There was a wide variation in the number of digits, and type of digits (alpha and numeric) entered in the field for the patient's Medicaid ID. There are two types of valid Medicaid IDs: 1) a number of 7 digits, the first and last of which must be alpha; and 2) a number of 9 or 11

⁹ Olinger, L. "Evaluation of the New York State PAC Project: Case Study of PAC Implementation", Abt Associates Inc. Cambridge, Massachusetts, May 1991.

digits (all digits are numeric). Based on these assumptions, almost half (48 %) of the sample had valid Medicaid IDs.

In addition, the primary provider (e.g., physician, nurse, etc.) designation of each visit is also potentially flawed. Findings from our case study interviews suggest that demonstration facility staff may have had the incentive to record that a physician was the primary provider, rather than a non-physician (e.g., nurse). Otherwise, reimbursement of claims might be questioned by the State.

Information on the utilization of ancillary services is more reliable due to the fact that most of the encounter forms used by demonstration facilities were precoded with the HCPCS codes of the services or procedures that were performed. This information was subsequently entered into the evaluation data set. Entry of the actual procedure or service is critical for assigning the visit to the appropriate PAC grouping, particularly for visits with procedures considered to be “key technology” services. As a result, we carefully examined the services and procedures provided to patients in the “key tech” PACs to ensure that only those HCPCS codes considered to be key technology services were actually performed. Only a small proportion (less than 1% of the final sample) of visits in the key technology PACs did not include any HCPCS codes designating key technology services. These visits were subsequently excluded from the final sample.

The price of the key technology service was assigned by New York State according to a price list which contains a unique price for each service (as defined by HCPCS code). However, we had to add 13 HCPCS codes that were found in the evaluation data set which were not included on the price list. A price was imputed for these observations based on the weighted median of the type of key technology (e.g., x-rays or catscans). In addition, a small proportion of visits in the key tech PACs did not contain a price for the key technology service that was provided. For these cases, we assigned the price that was identified on the price list for the specific key technology service.

In addition to patient characteristics, utilization and price information, the evaluation data set includes data on the length of time spent by the primary provider for each visit. **However, this information was recorded on the encounter form using intervals of time (e.g., 5-10 minutes), rather than the exact, or even approximate, number of minutes”** In addition,

demonstration staff” interviews conducted as part of the case study effort revealed that this information is not necessarily comparable between demonstration facilities. Some demonstration facilities modified the time intervals recommended by the NYS DOH using different categories of minutes. Thus, while these data would have been valuable information, we did not use any of the time variables to examine resource use except to the extent that they affected New York State’s estimates of labor costs.

As a result of the limited data prior to PAC implementation and the reliability of several data items, the findings from this analysis should be interpreted with caution.



Sampling Strategy

Because of the size of the data set and because a single facility (Presbyterian Hospital) accounted for a large share (about 50 percent), we developed a stratified sample of the data for analysis purposes. The sample was stratified according to:

- P A C
- pre or post demonstration onset
- facility.

PAC stratification entailed ensuring that all **PACs** were sufficiently represented in the analytic file to be able to perform analysis separately at the PAC level. In addition, since each facility joined the demonstration on a different date, the pre and post demonstration periods are defined uniquely for each demonstration facility. In general, data are available for 1-2 months prior to each facility’s “start” date; the post period lasts for 1-2 years. Finally, as noted data were available for 13 facilities in the post period and 11 in the pre period.¹⁰

This stratification scheme produces 264 (24*11) pre and 312 (24*13) post cells. We aimed for a sample of 100 in each pre cell and 200 in each post cell. For those cells where the universe of data was smaller than the desired number, we took the universe. For the remaining cells we selected a random sample of the desired size. The resulting sample size

¹⁰As noted in the case study report (“Evaluation of the New York State PAC Project: Case Study of PACs Implementation,” Abt Associates Inc., May 13, 1991), seventeen facilities participated in the PACs demonstration. However, data for 4 facilities were not usable.

includes a total of 57,664 visits, about 60 percent of which represents visits to hospital outpatient departments and the remaining 40 percent representing visits to diagnostic and treatment centers.

Separate analyses were performed on hospital-based and diagnostic and treatment (D&T) providers where appropriate. Individual providers were not independently examined because there was an insufficient number of providers to determine which provider characteristics were important.

Ancillary and Staff Utilization

As described in related reports¹¹, the incentives under the PAC system are similar to those under any prospective payment system: to lower costs by reducing input usage, i.e. by 1) reducing the use of ancillary services and 2) using less expensive staff. However, since prior to PACs implementation, all facilities were being reimbursed at capped rates, it is not clear that the demonstration would change provider behavior significantly.

Given the decision process of assigning visits into 1 of the 24 PAC groupings, however, there are additional provider incentives that may differ by PAC grouping. For example, the provision of a “key technology” (i.e., X-rays, mammograms, EEG’s, CAT Scans, MRI’s, cardiac stress tests, and ultrasounds) most often assigns a visit into a higher reimbursed PAC grouping. Similarly, the incentive to use certain high cost ancillary procedures in lieu of providing lower cost ancillary services will vary by PAC. For example, providers have the incentive under the PAC system to provide only a CAT Scan or nuclear imaging procedure for visits classified into PAC 24 (Diagnostic Investigation with Nuclear or Computerized Axial Tomography Imaging) and to forego other tests or procedures.

The probability of seeing these types of changes in the utilization of ancillary services and staff use after PAC implementation is dependent on at least two factors. First, the higher the proportion of visits reimbursed under PACs at a facility, the greater the incentive for the facility to actively engage clinicians in understanding the costs and benefits of the PAC

¹¹ Olinger, L. “Evaluation of the New York State PAC Project: Case Study of PAC Implementation”, Abt Associates Inc. Cambridge, Massachusetts, May 1991; Moon, M. et. al. “Applying PACS to Medicare: Final Report”, Urban Institute, Washington D.C., June 1991.

reimbursement and to change their patterns of clinical practice accordingly. In addition, our ability to detect significant changes in ancillary service utilization and staff use is dependent on the size of the sample of data before and after PAC implementation and the length of time in the post-implementation period. Previous evaluations of other prospective payment systems suggest that the learning curve required for facilities to maximize prospective reimbursement, particularly where it involves changing physician and clinical behavior, is at least one year.

Our on-site interviews with both administrative and clinical staff at about half of the demonstration facilities¹² strongly suggested that the implementation of the PAC system was purely an administrative and data processing function. Indeed, very few of the clinical staff (nurses and physicians) were aware of the existence of the new reimbursement system and its 24 groupings, much less what the "PAC" acronym meant. Furthermore, administrative staff reported limited ability to "game", or "upcode", the PAC system to achieve higher reimbursement, and none of the facilities reported using PACs as a management tool, either for monitoring utilization trends or physician behavior. Finally, as will be discussed below, the sample of data available for analysis is based on claims from demonstration facilities with about 1-2 years of experience under the PAC system and offers a limited amount of time during which we might expect to see any changes in utilization and staff use. Thus, combined with the findings from the on-site interviews, we do not expect to see significant changes.

Descriptive Statistics

In this section we present some simple comparisons of ancillary service and staff utilization before and after PACs implementation. These simple univariate comparisons produce estimates of the magnitude of all changes occurring at demonstration facilities between the pre- and post-PACs implementation periods. The following section uses regression techniques to control for other factors, e.g. changes in case mix, that might be expected to affect utilization.

¹² Site visits to 8 of the 17 demonstration facilities were conducted in the winter and spring of 1990, about one and half years after PAC implementation. The findings of these interviews are reported in Olinger, L. "Evaluation of the New York State PAC Project: Case Study of PAC Implementation" , Abt Associates Inc. Cambridge, Massachusetts, May 1991.

Two aspects of the model and the nature of the inferences to be drawn from it should be noted before presenting the results. First, no data are available from non-demonstration facilities reimbursed under fee-for-service. Because some changes in the selected outcome variables may have occurred as a result of influences apart from the incentives produced by the demonstration, the pre-post differences used here to estimate the effect of PAC reimbursement on utilization may overstate or understate the true effects. The modeling scheme rests, as it must, on the assumption that PAC reimbursement was the predominant influence causing utilization to change over the period under study. Nevertheless, the possibility that estimated “PAC-Effects” may be contaminated by other influences on utilization should be borne in mind.

Second, each of the outcome variables chosen for analysis is a binary measure of utilization; that is it records the existence or non-existence of an event. (e.g. Was the patient seen by a physician, or not?) Although OLS regression estimates are known to be unbiased in this case, standard errors may be underestimated to some degree. For this reason the standard “two-standard-error” rule for establishing the statistical significance of regression coefficients probably corresponds to a significance level somewhat lower than the traditional five percent.

Ancillary Service Utilization

Four measures of ancillary service utilization were examined, including the percentage of visits with:

- any ancillary procedure (including laboratory services and other services considered to be key technology procedures);
- any laboratory procedure;
- any radiology, ultrasound, nuclear medicine, or special physician procedure that is **not** considered to be a key technology;
- a radiology, ultrasound, nuclear medicine, or special physician procedure that is considered to be a key technology.

Table 1 shows the percentage of visits with ancillary procedures, laboratory procedures, non-key technology procedures and key technology procedures prior to and after

Table 1
Service Utilization and Primary Provider Use
(Percent of Visits) ^a

	All Facilities			Hospitals			D & T's		
	<u>Pre</u> (n=10317)	<u>Post</u> (n=47347)		<u>Pre</u> (n=8003)	<u>Post</u> (n=26884)		<u>Pre</u> (n=2314)	<u>Post</u> (n=20463)	
<u>Service Utilization</u>									
Ancillary Procedures	45.5%	51.6%	**	45.3%	48.8%	**	46.2%	55.3%	**
Laboratory Procedure	35.8%	36.2%		34.4%	32.1%	**	40.6%	41.7%	
Key Technology Procedure	15.8%	24.2%	**	18.1%	24.2%	**	7.7%	24.1%	
Non-Key Technology Procedure	2.1%	3.2%	**	1.8%	3.7%	**	3.1%	2.6%	
<u>Provider Type</u>									
Primary Care Physician	62.5%	71.3%	**	66.0%	76.0%	**	50.2%	65.2%	**
Specialist Physician	19.7%	9.1%	**	20.2%	9.4%	**	17.9%	8.7%	**
Non-Physician	17.9%	19.6%	**	13.8%	14.6%	+	31.9%	26.1%	**

Significance Level: **.01, *.05, +.10

^a
Percentages reflect service utilization and provider use across all payors.

Source: NYS DOH Evaluation Data Set August 1987- March 1990

Prepared by: Abt Associates Inc.

PAC implementation for all demonstration facilities, as well as for hospitals and diagnostic and treatment centers separately. Table 1 presents these results aggregated across all PACs. Appendix 2 shows the results for each PAC.

Ancillary Procedures: The percentage of visits with any ancillary procedures (regardless of whether a key technology was provided) across all PACs and facilities increases significantly from 46 percent prior to PAC implementation to 52 percent after PAC implementation. This increase in ancillary service use is also seen for the diagnostic and treatment centers where 46 percent of visits prior to PACs and 55 percent of visits after PACs included any ancillary procedure, and for hospitals, where the percentage increased from 45 percent prior to PAC implementation to 49 percent after PAC implementation. As described below, the increase in ancillary use is attributable to both laboratory and other diagnostic (key technology and non-key technology) procedures.

Laboratory Procedures: The percentage of visits with a laboratory procedure across all PACs and facilities increased slightly but was not significantly different between the pre and post periods. Again, this pattern is evident in the diagnostic and treatment centers. However, a significant decrease (albeit a small decrease) in the percentage of visits with a laboratory procedure is shown for hospitals between the two time periods.

Non-Key Technology Procedures: The percentage of visits with a radiology, ultrasound, nuclear medicine, or special physician procedure that is not considered to be key technology increases significantly (although it is a small increase) across all PACs for all facilities, from 2 percent prior to PACs to 3 percent after PAC implementation. This increase is even higher for visits in hospitals where the percentage of the visits with a non-key technology procedure doubled between the two time periods (pre: 2 % ; post: 4 %). The percentage of visits with a non-key technology procedure in diagnostic and treatment centers does not change significantly before and after PAC implementation.

Key Technology Procedures: The percentage of visits with a radiology, ultrasound, nuclear medicine, or special physician procedure that is considered to be key technology increases significantly across all PACs for all facilities from 16 percent prior to PACs to 24 percent after PAC implementation. This result is evident for hospitals and diagnostic and treatment centers. This increase is more striking for the Diagnostic and

Treatment Centers where only 8 percent of the visits had a key technology service provided prior to PACs compared to 24 percent of the visits included such procedures after PAC implementation. It is possible that the smaller D&Ts had not found it profitable to supply costly key technology services prior to PACs implementation but found it worthwhile subsequent to the change in reimbursement methodology. It is also not clear that the PACs reimbursement system creates incentives to provide key tech services. While, for the most part, provision of a key tech service results in classification of the visit in more generously reimbursed PAC group, Table 4, discussed below, suggests that the average margin $[(\text{Price} - \text{average cost})/\text{cost}]$ is smaller than for less costly PACs. For example, PAC 1 was priced at \$21 and had a margin of about 75 % $[(21-12)/12]$; while PAC 7 was priced at \$130 and had a margin of about 18% $[(130-110)/110]$.

Given the findings of the case studies, which suggested that little clinical significance was placed on PACs implementation, the capped structure of the previous reimbursement programs, and the short period for evaluation data, it is somewhat surprising that ancillary use changed as much as it did. However, during the time period studied (1987-1990), nationwide, there was a general increase in the usage of diagnostic (particularly imaging) testing nationwide.¹³ Since control sites were unavailable to the evaluation of PACs it is impossible to distinguish between general trends and evaluation-specific effects.

Staff Substitution

As described earlier, any prospective payment system provides the incentive to substitute less expensive staff (e.g. general practitioners, physician assistants, nurses) for more highly trained specialized physicians. To identify whether demonstration facilities used this strategy, we examined the percentage of visits seen by a general physician (including obstetrician-gynecologists), a physician specialist, and by non-physician personnel (i.e., nurse practitioner, physician assistant, etc.) before and after PAC implementation (see Table 1). Over all PACs and facilities, the percentage of visits in which the primary provider was a primary care physician increased significantly from 63 percent before PACs to 71 percent after PAC

¹³Physician Payment Review Commission, "Fee Update and Medicare Volume Performance Standards for 1992," Report No. 91-3.

implementation. This increase in the use of general physicians is found in both hospitals and D&Ts.

On the other hand, across all PACs and facilities, the percentage of visits where the primary provider was a physician specialist decreased significantly from 20 percent prior to PACs to 9 percent after PACs. This dramatic decrease is consistent across both types of facilities and for most PACs (see Appendix 2) as well.

Finally, the percentage of visits in which the primary provider was not a physician increased from 18 percent to 20 percent across all PACs and facilities. The pattern appears to hold only for D&Ts, however, and may reflect a general trend. The pattern also varies across PACs.

Regression Results on Utilization

Regression estimates of the effect of the PAC demonstration on outpatient utilization of health care services also rely on differences before and after the implementation in the occurrence of particular events. These events are defined as the probability that a given patient who appeared at a demonstration facility: 1) was seen by a physician, 2) was seen by a physician specialist, 3) received any ancillary services, 4) received any lab tests, 5) received any non-key tech services, or 6) received any key-tech services. In order to protect against bias arising from differences in the mix of patients across facilities, a linear regression model was specified to control for these other influences while estimating the changes in the outcome variables attributable to the implementation of PACS. Definitions of the independent variables are provided in Table 2.

In addition to the independent variables shown in Table 2, various interactions of the pre-post PACs dummy variable with other explanatory variables are included, as described below. Moreover, the regressions include dummy variables to isolate PAC- and facility-specific effects. The coefficients on these latter variables are not included in the regressions.

Table 3 presents the regression results for the six measures of utilization. Of particular interest is the interaction of the dummy variable for Medicaid as primary payor (**MEDICAID**) with the indicator for the time period in which PAC reimbursement was in effect

Table 2

Variable Definitions

Dependent Variables

PHYSICIAN	= 1 if patient was seen by a physician during the visit =0 otherwise
SPECIALIST	= 1 if patient was seen by a specialist during the visit = 0 otherwise
ANCILLARY	=1 if ancillary services were performed during the visit =0 otherwise
LAB	= 1 if lab tests were performed during the visit =0 otherwise
KEY	= 1 if a key technology procedure was performed during visit =0 otherwise
NON-KEY	= 1 if a non-key technology procedure was performed during the visit =0 otherwise
TOTAL COST	average total cost of PAC to which visit is assigned
ANCILLARY COST	average ancillary cost of PAC to which visit is assigned

Independent Variables

POST	= 1 if the visit occurred during the demonstration period =0 otherwise
FEMALE	= 1 if patient was female =0 otherwise
AGE	patient's age in years
MEDICAID	= 1 if Medicaid is patient's primary payer =0 otherwise
HOSPITAL	= 1 if visit occurred in a hospital outpatient department or diagnostic and treatment center =0 otherwise
DOWNSTATE	= 1 if facility was located in Downstate New York =0 otherwise
TEACH	= 1 if facility is a teaching institution =0 otherwise

Table 3
Regression Results for Ambulatory Care Utilization at PAC Sites

Dependent Variables:	Seen by Physi- cian	Seen by Specialist	Provided Ancillary Test	Provided Lab Tests	Provided Key Technology	Provided Non-Key Technology
	[1]	[2]	[3]	[4]	[5]	[6]
Intercept	0.840 (56.5)	0.104 (9.3)	1.066 (62.0)	0.588 (30.8)	0.977 (163.0)	0.013 (1.8)
FEMALE	-0.027 (-7.8)	-0.009 (-3.6)	0.018 (4.7)	0.013 (2.9)	0.001 (1.1)	0.006 (3.5)
AGE	0.001 (12.6)	0.000 (7.0)	-0.000 (-5 .0)	-0.000 (-2.4)	0.000 (4.1)	-0.000 (-6.0)
MEDICAID	-0.020 (-3.0)	0.005 (1.0)	-0.003 (-0.3)	-0.009 (-1 .0)	0.003 (1.1)	-0.005 (-1.5)
POST	-0.009 (-1.0)	-0.026 (-4.0)	-0.021 (-2.0)	-0.029 (-2.6)	0.015 (4.1)	-0.004 (-0.8)
POST*HOSPITAL	-0.014 (-1.6)	-0.054 (-7.9)	-0.003 (-0.3)	-0.022 (-1.9)	-0.011 (-2.9)	0.016 (3.7)
POST*MEDICAID	0.023 (3.1)	-0.003 (-0.5)	0.000 (0.1)	0.009 (1.0)	-0.005 (-1.7)	0.003 (0.9)
R ²	0.24	0.32	0.37	0.16	0.89	0.07
N	57,664	57,664	57,664	57,664	57,664	57,664

Note: t-statistics appear in parentheses.

Note: The regressions also include 23 PAC and 12 facility indicator variables.

(POST) Since the demonstration incentives would be expected to affect the treatment of **Medi-**caid enrollees, the coefficient of this variable is most likely to reflect true PAC effects.

Regression [1] indicates that, overall, Medicaid patients are less likely than others to see a physician during an ambulatory care visit. Surprisingly, during the demonstration period, however, this discrepancy was completely offset, suggesting that some feature of the reimbursement mechanism may have ameliorated or eliminated a pre-existing discrepancy in access to physician care. The implementation period saw a general decline in the proportion of all patients who were seen by specialists, as indicated by the coefficient of POST in regression [2]. Because there was no differential effect for Medicaid patients, there appears to be no basis for concluding that the demonstration changed patterns of referral to specialists. The results for performance of ancillary procedures (regression 3) and laboratory tests (regression 4) are much the same: a general decline in utilization in the PAC implementation period, but no differential decline for Medicaid patients, leaving **no** strong reason to conclude that the **PACs** program affected these dimensions of care for Medicaid patients.

The frequency of use of key technology procedures increased in the demonstration period as may be seen by examination of the POST coefficient in regression [5]. It is possible that this increase was less pronounced for Medicaid recipients, since the coefficient of **MEDI-CAID*POST** is negative, but given the reported significance level and the likely underestimate of standard errors noted earlier, **firm** conclusions cannot be drawn. For non-key tech procedures, examined in regression [6], there is no evidence that PACS affected utilization in any direction.

Intra-Pat Homogeneity **and** Interpac Heterogeneity

Intra-PAC Analysis

The price component of the PAC reimbursement methodology is intended to account for labor (provider) and ancillary (lab, x-ray, procedure) costs. Included within ancillary costs are expenditures on "key technologies." PACs were designed to maximize the homogeneity of resource use within each PAC while assuring differences across **PACs**. Data on variation in actual resources used within and across **PACs** are necessary to test the success of the PAC classification system in establishing homogeneous categories of ambulatory visits.

Table 4 depicts average total, ancillary and labor costs for each PAC as well as the coefficient of variation (ratio of the standard deviation, to the mean times 100) for each. Statistics are calculated from the post-implementation data only to assure that any effects of the PAC reimbursement system on service provision are reflected in the data.

It is evident that there is considerable variation in the homogeneity of different **PACs**. The coefficient of variation in total cost ranges from 37 percent for PAC 24 (Diagnostic investigation requiring a CT scan, **MRI** or nuclear medicine procedure) to 147 percent for **PACs** 9 and 10 (prenatal visits). Most of the measured variation within **PACs** is caused by variation in usage of ancillary services. The coefficients of variation on ancillary cost greatly exceed those for labor costs. However, the distinction may be largely attributable to a measurement problem. Provider time is only reported in intervals (e.g. 0-5, 6-15). Since the provider time costs of a visit requiring 6 minutes are computed as identical to one requiring 15 minutes, the labor cost data are artificially smoothed.

Because of the flawed reporting of provider time requirements it is impossible to draw any firm conclusions regarding the absolute homogeneity of each PAC. However, it is possible to explore determinants of variation in homogeneity across **PACs**. In general, more expensive **PACs** exhibit lower variation in total costs. Table 5 lists the **PACs** in ascending mean cost order. The first column presents the ranking of each **PAC's** coefficient of variation (1 is highest). It is evident that the most expensive **PACs** have the lowest CVs. Those 13 **PACS** with a coefficient of variation exceeding 100 percent have a mean cost of \$31, while the remaining 11 **PACs** with a CV of less than 100 percent have a mean cost of \$103. Generally, the more expensive **PACs** are those in the diagnostic column (**PACs** 3, 7, 9, 13, 15, 17, 21, 22 and 24.) The average coefficient of variation of these nine **PACs** is 67 percent, while that of the remaining **PACs** is 114. Since the expensive diagnostic **PACs** tend to include substantial use of costly ancillary tests, it is not surprising that the ratio of ancillary to total costs is generally negatively related to variability in total costs. In addition the coefficient of variation in ancillary costs is almost perfectly inversely ranked with mean total costs as shown in the third column of Table 5.

Table 4 also presents other statistics that describe PAC costs and their variability. Both median costs and the ratio of mean to median costs are presented in Table 5. Not

Table 4

#	DESCRIPTION	N Sample	N Universe	PAC	TOTAL COST			ANCILLARY COST			LABOR COST						
				PRICE	MEAN	COEF	VAR	MEDIAN	QRANGE/ MEDIAN	MEAN/ MEDIAN	ANCIL/ TOTAL	MEAN	COEF	VAR	MEAN	COEF	VAR
				88- 89													
1	Well Care Exam Age 0-2	2187	60830	\$21.02	12.01		76	9.18	65	1.31	0.25	3.02	277	8.99		43	
2	Well Care Exam Age 3-17	2143	25310	\$33.18	16.80		93	11.25	82	1.49	0.43	7.20	202	9.60		44	
3	Diag. Inv., Age 0-17	1375	7066	\$90.95	83.88		68	64.89	60	1.29	0.89	74.45	75	9.43		49	
4	Prob. Mgnt, Age 0-17	2187	143473	\$20.05	12.10		99	8.25	45	1.47	0.29	3.47	320	8.63		45	
5	Medication Administration	2024	20728	t9.43	9.88		128	7.18	101	1.38	0.33	3.25	361	6.63		65	
6	Annual Exam Adult Age > 17	2102	20903	\$45.17	34.16		126	16.50	204	2.07	0.69	23.67	178	10.49		51	
7	Diag. Inv., Routine Adult Problem	2084	24666	\$129.86	109.99		63	83.40	98	1.32	0.91	100.29	69	9.71		51	
8	Hgmt, Routine Adult Prob. Age>17	2192	233418	\$25.14	16.91		136	11.00	82	1.54	0.46	7.83	284	9.08		54	
9	Initial Prenatal Evaluation	1505	10525	\$140.76	75.99		109	49.98	174	1.52	0.86	65.06	127	10.93		49	
10	Prenatal Visits, Age >34 or <19	1794	20023	\$50.65	42.20		147	16.50	199	2.56	0.77	32.41	192	9.80		48	
11	Prenatal Visits, Age 19-34	1865	69965	\$38.86	41.82		147	16.50	203	2.53	0.77	32.01	191	9.80		48	
12	Annual Gynecological Exam	1975	19453	\$42.64	36.12		111	24.57	128	1.47	0.71	25.66	154	10.46		47	
13	Diag. Inv. - Reproductive Prob.	1360	6073	\$198.45	179.79		39	174.39	45	1.03	0.95	170.04	41	9.74		53	
14	Hgmt of Reproductive Prob.	2197	80086	\$34.73	22.89		110	15.87	132	1.44	0.60	13.84	176	9.05		55	
15	Diag.Inv., Chronic Prob.	1996	24644	8182.42	151.01		58	133.12	80	1.13	0.93	140.74	62	10.27		50	
16	Mgmt of Chronic Problem	2185	285515	\$35.00	23.25		114	11.25	181	2.07	0.58	13.39	194	9.86		52	
17	Diag. Inv., Cancer/Blood Problem	749	5339	\$159.17	143.20		59	124.66	79	1.15	0.90	128.48	65	14.72		63	
18	Hgmt, Chemo/radio therapy tnt	623	8127	\$82.30	47.09		107	33.00	178	1.43	0.75	35.14	144	11.94		62	
19	Mgmt of Cancer/Blood Problem	1738	53643	546.92	25.00		115	14.94	135	1.67	0.55	13.84	199	11.17		62	
20	Prob. Mgnt, Mental, Subs. Abuse	1993	15238	\$27.90	17.19		124	11.00	82	1.56	0.41	6.97	292	10.22		54	
11	Audiological Testing	801	10743	\$21.38	11.21		66	11.25	67	1.00	0.06	0.71	930	10.50		37	
22	Ophthalmological Services	988	78657	\$21.30	13.40		105	1b.50	83	1.28	0.14	1.94	657	11.46		61	
23	Speech & Rehab. Therapy	795	63841	\$22.76	12.25		81	11.00	68	1.11	0.10	1.21	669	11.04		55	
24	Diag. Inv. w/ Nuke, CAT, MRI	879	6760	\$433.80	404.29		37	378.62	40	1.07	0.97	391.82	38	12.47		62	

PAC RANKINGS BASED ON VARIATION MEASURES
RANK OF 1 IS HIGHEST - SORTED BY MEAN COST

PAC	TOT CV	PRN MED	ANC CV	MEAN COST
24*:CAT Scans and Nuclear Imaging	24	24	24	1
13*:Diagnostic Invest. Reproductive	23	23	23	2
15*:Diagnostic Invest. Class 3	22	15	22	3
17*:Diagnostic Invest. Class 4	21	16	21	4
7*:Diagnostic Invest. CLASS 2, Over 17	20	11	20	5
3*:Diagnostic Invest. Class 1, 0-17	18	21	19	6
9 :Initial Prenatal Evaluation	11	5	18	7
18 :Management of Chemo&Radio Therapies	12	6	17	8
10 :Prenatal Revisit, Under 19/Over 34	1	2	12	9
11 :Prenatal Revisit, 19-34	2	1	13	10
12 :Annual Gynecological Exam	9	8	16	11
6 :Annual Well Care Exam, Over 17	5	3	14	12
19 :Management Class 4	7	9	10	13
16 :Management Class 3	8	4	11	14
14 :Management Reproductive	10	7	15	15
20 :Management Class 5	6	14	6	16
8 :Management Class 2, Over 17	3	13	7	17
2 :Annual Well Care Exam, 3-17	15	12	9	18
22 :Opthamological Services	13	17	3	19
23 :Speech and Rehabilitation Therapies	16	18	2	20
4 :Management Class 1	14	22	5	21
1 :Well Care, 0-2	17	20	8	22
21 :Audiological Test iny	19	19	1	23
5 :Medication Administration	4	10	4	24

surprisingly, the data are somewhat right-skewed; in all cases the mean exceeds the median. However, the degree of skewness varies across **PACs**. Again a systematic pattern is evident. All **PACs** in the “problem management” (4, 8, 10, 14, 16 & 19) and in the “well care” (1, 2, 6, 11 and 12) categories have means that are at least 45 percent greater than the median, indicating some substantial outliers. Apparently in these **PACs**, the routine “typical” patient is fairly straight-forward, however a limited number of patients present themselves as much more complicated cases.

The table also shows the ratio of the quartile range (third quartile minus first quartile) relative to the median. This ratio could be considered the non-parametric equivalent of the coefficient of variation. It presents reasonably similar findings to the coefficient of variation, but Table 5 indicates some differences in the **PAC** rankings, particularly for those **PACs** exhibiting the greatest skewness.

In conclusion, it appears that there is considerable variation across **PACs** in the degree of cost homogeneity of the cases that are grouped into the **PAC**. High cost, diagnostic **PACs** seem to exhibit the least amount of internal variation, while the management **PACs** are less consistent.

Inter-PAC Analysis

While it is important to ensure that a classification system creates categories of cases that are relatively homogeneous, the system is most parsimonious when there is a great deal of variation in the cases assigned across categories. Otherwise, it should be possible to collapse multiple categories into a single classification without sacrificing substantial internal consistency. For the most part, the data suggest that the classes of cases created by the **PAC** system are each relatively distinct.

The one exception to this pattern has been fixed within the last year by New York State. In the original system, **PACs** 10 and 11 indicated prenatal visits for 1) the under 18 and 35+ and 2) women between the ages of 18 and 35. The resulting distributions of cases for the two **PACs** showed nearly identical distributions: the means, medians, skewness and ratios of ancillary to total costs were very similar. In addition, both indicated a high degree of internal variability. As part of last year’s revision to the **PAC** system (described in Abt Associates’ Case

Study Report), these two **PACs** were modified. Cases are now assigned to **PACs** 10 or 11 according to whether they certain ICD-9 codes indicate high risk or not. While we don't have data to test the validity of this classification scheme, intuitively it appears to provide a more appropriate distinction of the resources that are likely to be provided during the typical visit.

The 24 **PAC** categories explain about two thirds of the total variance in total and in ancillary costs in the one-way analysis of variance using **PACs** as groups.¹⁴ These **ANOVAs** are shown in regression form in Table 6 (regressions [7] and [8]). This degree of variance explanation is quite high relative to that achieved by the **DRG** (Diagnosis-Related Groups) system which has been found to account for no more than 35 percent of the variation in Medicare hospital costs.

Regressions [9] and [10] add dummy variables for facility, location, and time period. While overall costs did not change significantly after implementation of the demonstration, both total and ancillary costs declined for hospital providers, as seen from the coefficient of **HOSPITAL*POST**. Because of the absence of appropriate control variables, the role of the demonstration in generating this decline cannot be ascertained. Also notable is that teaching hospitals are actually estimated to be lower in cost than others holding facility and **PAC** constant.

Summary

This chapter has presented data analysis regarding two issues of interest in evaluating the New York **PACs** program. First, we have analyzed the effect of **PACs** implementation on demonstration provider practice patterns. Second, we have examined the usefulness of the **PACs** classification system in categorizing non-surgical ambulatory care patients.

Data analysis on the effect of **PACs** on service provision suggest that some significant changes occurred in the period surrounding **PACs** implementation. Use of ancillary services, particularly imaging procedures, increased substantially. Primary care physicians also

¹⁴ More precisely, the "between-group" sum of squares is equal to two thirds of the total sum of squares about the grand mean.

<p>Table 6</p> <p>Regression Results for Cost of Ambulatory Care at PAC Sites</p>				
Dependent Variables:	Total costs [7]	Ancillary costs [8]	Total costs [9]	Ancillary costs [10]
intercept	41.529 (44.6)	31.720 (34.2)	39.412 (27.9)	31.333 (22.3)
PAC1	-29.256 (-22.7)	-28.665 (-22.3)	-29.049 (-22.5)	-28.328 (-22.1)
PAC2	-24.348 (-18.5)	-24.407 (-18.7)	-24.112 (-18.4)	-23.911 (-18.3)
PAC3	43.416 (28.8)	43.573 (29.1)	43.206 (28.6)	43.631 (29.0)
PAC4	-28.926 (-22.8)	-27.829 (-22.1)	-28.744 (-22.7)	-27.519 (-21.9)
PAC5	-31.399 (-23.3)	-28.395 (-21.2)	-30.891 (-22.9)	-27.562 (-20.5)
PAC6	-6.540 (-4.9)	-7.313 (-5.5)	-6.000 (-4.5)	-6.461 (-4.8)
PAC8	-24.647 (-19.4)	-23.783 (-18.9)	-24.324 (-19.2)	-23.260 (-18.5)
PAC9	34.695 (23.4)	33.437 (22.6)	35.319 (23.7)	34.136 (23.1)
PAC10	1.923 (1.4)	1.892 (1.4)	2.084 (1.5)	2.102 (1.5)
PAC12	-6.482 (-4.7)	-7.086 (-5.2)	-6.326 (-4.6)	-6.589 (-4.8)
PAC13	139.771 (94.2)	139.949 (94.9)	139.447 (93.6)	139.733 (94.5)
PAC14	-18.179 (-14.2)	-17.348 (-13.6)	-17.895 (-14.0)	-16.891 (-13.3)
PAC15	109.440 (81.0)	108.842 (81.0)	109.675 (81.0)	109.276 (81.2)
PAC16	-18.070 (-14.3)	-17.876 (-14.2)	-17.772 (-14.0)	-17.392 (-13.8)
PAC17	104.254 (59.5)	99.640 (57.2)	103.470 (58.5)	99.607 (56.7)

<p>Table 6 Regression Results for Cost of Ambulatory Care at PAC Sites</p>				
Dependent Variables:	Total Costs [7]	Ancillary Costs [8]	Total Costs [9]	Ancillary Costs [10]
PAC18	6.786 (3.5)	4.621 (2.4)	5.982 (3.1)	4.716 (2.4)
PAC19	-16.498 (-12.0)	-18.021 (-13.1)	-16.439 (-11.9)	-17.643 (-12.8)
PAC20	-23.951 (-17.8)	-24.810 (-18.6)	-23.672 (-17.6)	-24.306 (-18.2)
PAC2 1	-30.535 (-16.0)	-3 1.041 (-16.4)	-30.698 (-16.0)	-30.634 (-16.1)
PAC22	-27.416 (-17.4)	-29.829 (-19.1)	-28.408 (-17.9)	-30.130 (-19.1)
PAC23	-29.379 (-17.9)	-30.711 (-18.8)	-30.602 (-18.5)	-31.451 (-19.1)
PAC24	370.807 (220.6)	368.403 (220.5)	370.203 (218.9)	368.301 (219.2)
DOWNSTATE	--	--	.334 (.491)	.024 (.04)
HOSPITAL	--	--	3.818 (2.809)	.559 (.4)
POST	--	--	0.897 (0.8)	-0.350 (-0.3)
POST*HOSPITAL	--	--	-5.532 (-4.3)	-3.665 (-2.8)
DOWNSTATE*HOSPITAL	--	--	7.029 (7.6)	7.888 (4.1)
MEDICAID	--	--	1.143 (2.7)	1.765 (4.1)
TEACH	--	--	-2.654 (-3.4)	-3.194 (-4.1)
R ²	0.66	0.66	0.66	.66
N	57,664	57,664	57,664	57,664

Note: t-statistics appear in parentheses.

assumed a larger role in the provision of care, while the importance of both specialist physicians and non-physician personnel diminished. Unfortunately, given the lack of control sites with which demonstration facilities behavior can be compared, it is impossible to determine whether changes in demonstration provider behavior should be attributed to the institution of **PACs** or to other forces. Since the regressions suggest that, for the most part, changes in provider behavior are not focused on Medicaid patients, if there was a "**PACs** effect," it was not limited to the Medicaid program.

Measurement of intra-PAC homogeneity and inter-PAC heterogeneity in input costs suggests that the **PACs** system performs reasonably well in classifying patients. In particular, **PACs** explain about two thirds of the variation in total costs. This finding, however, should be treated somewhat cautiously since variation in measured costs is artificially reduced by the use of broad intervals to measure provider time as well as a fixed fee schedule to assign ancillary test costs.

CHAPTER 4

APPLICABILITY OF PAC SYSTEM TO MEDICARE

As part of the evaluation of the PAC reimbursement system in New York State, the Urban Institute explored the applicability of the PAC system to the Medicare program. Using Medicare administrative claims, this study examined the adjustments that would be required by Medicare to run the PAC grouper software, how well the system would classify services into the PAC categories, and the distribution of Medicare cases across the PAC categories, including the distribution across different types of hospitals in various locations.

This chapter summarizes these results beginning with a review of the adjustments that were required to the Medicare claims before the data could be run through the PAC grouper software. The next section presents the results from the group& software run, showing how Medicare claims were distributed among the PAC groups. The third section summarizes the results of an analysis of PAC distribution by various hospital characteristics and the variation in claim amounts within PAC groups. The fourth section discusses the estimated winners and losers under a national PAC system. The chapter concludes with Urban Institute's conclusions regarding the applicability of PACs to the Medicare program.

Adapting Medicare Data to Run the PAC Grouper

Since Medicare data were not designed for use with the PAC grouper software, a number of adjustments had to be made before the software could be run. The PAC system was developed to use claims that were specially coded to provide all the necessary information and in the appropriate form to be placed into one of 24 groups. Medicare claims, however, reflect the data required by HCFA for payment and do not necessarily have all the information necessary for assigning visits into PACs groups. The Urban Institute found that, for the most part, most key variables needed to assign visits to PACs are available from the Medicare data, requiring only a few simplifying assumptions.

Adapting the Medicare data to run the PAC grouper required three basic steps: 1) creating a merged Hospital Outpatient Department/Part B Medicare Annual Data System (HOP/BMAD) file for analysis; (2) making adjustments so that the PAC grouper would run on

the merged database; and (3) eliminating claims that should not be subjected to the PAC grouper.

The PAC system requires information on both facility and physician use of services. The Medicare data system, however, treats separately facility bills and physician and other provider bills. Consequently, for this analysis the Urban Institute merged two major 1987 data files from HCFA's administrative records: the hospital outpatient department (HOP) file and the BMAD beneficiary files that capture physician charges¹⁵. Both the databases are five percent files, capturing information for a five percent sample of Medicare beneficiaries. The merge allowed UI to combine facility and physician charge information in ways consistent with the "bundling" of services that PACs achieves. The initial merged file contained 1,235,094 claims.

Although the merged Medicare data set contained most of the information needed to run the PAC software, several adjustments were necessary to compensate for missing data. Examination of the data elements in the merged data base revealed that there were four instances where additional adjustments were necessary to accommodate the PACs software. First, the indicators of "first", or new, visits were not available in an appropriate form in the Medicare data. This was mainly a problem for identifying first prenatal visit -- a category not very important to the Medicare population. Consequently, it was assumed that none of the claims were first prenatal visits, assuring that no Medicare claims would be assigned to PAC group 9.

Second, since the PAC grouper uses age of patient, the reliability of this variable in the data was examined. When the Medicare status code indicated the beneficiary was aged, all claims where the age was listed as 18 through 64 were eliminated. This adjustment eliminated 2,023 claims.

Third, while three clinic identifiers are required for PAC assignment, not all three were available on the merged data base. Audiology and rehabilitation were available from the HOP file, but ophthalmology clinics were not identified. Instead, HCPCS codes indicating the use of ophthalmological services were identified and were used as a proxy of ophthalmology clinic visits. Thus, if a claim contained any of those HCPCS codes it was assumed the visit was provided in the relevant ophthalmology clinic.

¹⁵Fortunately, these data were being combined as part of another project, so minimal effort was required to obtain the merged file.

Finally, claims that consisted only of routine venipuncture services were also eliminated from the merged file. This adjustment eliminated 4,458 claims.

To derive a final set of claims for analysis, two major sets of inappropriate claims also had to be excluded from the data base -- surgical claims and claims without a clinic visit. To purge the data base of surgical claims, New York State's Products of Ambulatory Surgery (PAS) system grouper software was run on the data base **first**¹⁶. Running the PAS grouper on the merged data base assigned 126,976 claims to PAS groups; these claims were removed from the merged file. A subset of these claims included nonsurgical HCPCS codes as well as surgical ones. For the purpose of this analysis, however, those claims were ignored as it was not possible to disaggregate the charges, to the surgical and non-surgical procedures.

The **final** adjustment to the files eliminated those claims without a clinic visit. The PAC system is designed to reimburse for outpatient services that begin with a clinic visit and that may or may not include ancillary services. Thus, a visit originating in a hospital OPD clinic is the key identifier for determining whether the visit is eligible for PAC assignment. "Referred ancillary" services are not intended to be part of the system where the goal is to bundle visits, tests, and nonsurgical procedures. To remove such services, the file was sorted to determine **which** claims had no visits that would place them in the PAC system. Over half the claims (50.4 percent or 557,679 claims) fell into this category. The next step was to attempt to match the non-office visit claims to a patient's earlier claims in which the ancillary services may have been ordered. The rule used was to search an individual's file forward in time for up to 30 days after an office visit claim for a non-visit OPD claim. If any were found, they were merged with the office visit claim, and the combined claim was put through the PAC grouper. The process of matching non-visit claims to earlier visit claims combined 56,277 records. That is, 10.1 percent of all the non-visit claims could be combined with a visit claim. Consequently, the PAC grouper was ultimately applied to 54.7 percent of all relevant non-surgical OPD claims. Presumably the other 45.3 percent would have to be reimbursed under some other reimbursement methodology.

¹⁶New York State also developed a prospective payment system for ambulatory surgery. Similar in concept to PACs, the Products of Ambulatory Surgery (PAS) reimbursement system has 42 PAS categories.

Even though the full file was successfully run through the PAC grouper, two additional adjustments were necessary before the file could be used for analysis. The first adjustment was to trim the data set to eliminate claims that appeared to have erroneous charge information. Claims with zero charges and claims with total charges more than 2.5 standard deviations from the mean (after converting the data to logged values) were eliminated. Lastly, End Stage Renal Disease (ESRD) claims were deleted since they often reflect multiple visits. The distribution of PACs using the trimmed file changes very little from the initial distribution. Deletion of ESRD claims results in minor differences as well with the major elimination coming from claims in PACs 3 and 4. The analysis summarized below was then conducted on a file of 500,611 Medicare claims.

The Distribution of Medicare Claims by PAC

After all the adjustments described above were performed, the Medicare data were run through the PAC grouper software and distributed among the PAC groups. as shown in Table 1. As can be seen, for the Medicare data for 1987, the most important categories, by far, are for Class II and Class III problems.¹⁷ The management and diagnostic service categories for these two classes account for just over 80 percent of all the classified bills. The PAC grouper did not categorize any of the Medicare claims into PACs 1, 2, or 9. PACs 1 and 2 are for well baby care examinations and PAC 9 is initial prenatal care. In addition, since Medicare does not cover routine physical, it is understandable that PACs 6 and 12 contained very few claims.

¹⁷Class II problems include musculoskeletal, nutritional, ear, nasopharynx, respiratory, skin, infections, and injuries. Class III problems refer to the adult digestive and hepatobiliary system, the nervous system, the circulatory system, the urological system, arthritis, rheumatism and other inflammatory/degenerative diseases of the joints and bones, diabetes and other metabolic problems and diseases of the endocrine system and pancreas, congenital disorders, and patients with medical problems attendant to mental illness, alcohol and drug abuse, social problems and physical medicine.

The Distribution of PAC Groups and Average Combined Payments

The first analysis performed on the data file was designed to **find** out if PACs would classify patients similarly in different regions of the country, in urban versus rural locations, and for clinics in hospitals with varying characteristics.*

Regional variations. Patterns of medical treatment in the United States vary considerably by region of the country. These variations are likely to result in differences in the role that hospital outpatient departments play in providing medical services. If such services are more important in one region than in another, the distribution of services by PAC might also vary. However, when the data were sorted by region and each region was run through the PAC grouper software separately, the distributions proved to be quite stable. Both the ordinal ranking of PACs and the proportion within each group showed little variation across regions.

Urban/rural location. The distributions of PACs for various metropolitan statistical area size classifications were also examined. The same types of concerns about regional variation apply to urban versus rural settings as well. Here, some large distributional differences were found. Class II problems (PACs 7 and 8) accounted for more claims in nonmetropolitan areas than elsewhere. Rural and smaller urban areas also showed a slightly greater concentration of diagnostic as opposed to management PACs. CT scans and MRIs (PAC 24) are most prevalent in small urban areas, perhaps because they are more likely to be performed in free-standing facilities in large urban areas.

Hospital characteristics. An analysis of the variation in the distribution of PACs for hospitals ranked by bed size found that OPDs in hospitals with more than 300 beds have a smaller proportion of diagnostic PACs than the overall average. This seems counterintuitive since hospital centers are thought to see the more complex cases. On the other hand, if large facilities have large outpatient departments and highly organized clinics, their clinics may also treat proportionately more patients receiving routine services than smaller facilities. Results

¹⁸The Urban Institute analysis is based only on claims from hospital outpatient departments and does not include any claims from free-standing health clinics. Claims from clinics are not easily identified in Medicare data.

Table 1

Medicare PAC Distribution, After Trimming and Excluding ESRD Patients

<u>PAC</u>	<u>Description</u>	<u>Percent of Claims</u>
7	Diagnostic Investigation, Class II, A = 17 +	24.3
8	Management of Class II Problem, A = 17 +	22.3
16	Management of Class III Problem	22.1
15	Diagnostic Investigation of Class III Problem	11.6
24	Diagnostic Investigation with Nuclear or CT Scan	4.2
22	Ophthalmological Services	3.1
23	Speech and Rehabilitation Therapy	3.1
19	Management of Class IV Problem (w/ malignancies)	2.6
20	Management of Class V Problem (mental illness substance abuse)	2.3
17	Diagnostic Investigation of Class IV Problem	1 . 3
18	Management of Chemotherapy and Radiotherapy Treatment	1.0
14	Management of Reproductive Problems	0.9
13	Diagnostic Investigation of Reproductive Problems	0.7
21	Audiological Testing	0.4
6	Annual Examination, A = 17 +	0.1
5	Medication Administration	0.1
12	Annual Gynecological Examination	*
1 1	Prenatal Revisits, Age 19-34	*
10	Prenatal Revisits, Age Over 35 or under 19	*
4	Management of Class I Problem, Child O-17	*
3	Diagnostic Investigation of Class I Problem, Child O-17	*

* Rounds to less than 0.1 percent.

N = 500,611

showed these larger institutions also tend to have a slightly more diffuse distribution of PAC groups. The top four PAC categories account for 77.3 percent of all claims in hospitals with more than 300 beds as compared to 80.2 percent across all hospitals. Not surprisingly, hospitals with less than 100 beds are less likely to offer CT scans or MRIs to their patients. These smaller facilities also have a greater concentration of the less complicated Class II problems.

The second analysis examined whether the PAC system achieved its goal of distinguishing between visits that require “more extensive resources required to care for more complex problems” and routine management of care. An average combined payment was calculated for

each PAC that included the facility costs (calculated by multiplying the reported charges by the facility's average cost-to-charge ratio) and all allowed charges from the BMAD file for the visit.

The analysis of the average combined payments indicated that, within each patient class, the diagnostic PACs generally constituted substantially higher cost claims than the management PACs. PACs 7 and 8 both fall in class II, but total payments for all claims grouped in PAC 7, diagnostic investigations, are 59 percent higher than claims in PAC 8. For Class III, the average combined payment for the diagnostic PAC (PAC 15) is 76 percent higher than for management services in that class (PAC 16).

Examination of coefficients of variation (CVs) for each PAC suggest variation similar to that found in the New York State evaluation data. The CVs for the combined payments within each PAC ranged from 0.51 in PAC 24 to 1.28 in PAC 19. Seven PACs had CVs greater than 1. Thus, although the PACs do seem to differentiate patient categories reasonably well, there is substantial variation within some PACs.

To estimate the overall explained variance attributable to PACs, the analysis used the General Linear Model (GLM) analysis of variance technique. Results found that the PAC categories perform substantially better at explaining variances in payment amounts than either the principal ICD-9 diagnosis codes or the system's diagnostic service categories (DSCs). The R^2 for the PAC groupings was 0.108 before trimming, 0.237 after trimming, and 0.245 when End Stage Renal Disease patients were excluded. This result is considerably lower than what was found using the NYS evaluation data ($R^2 = .66$). There are two possible explanations for this difference. First, it is possible that there is less random variation in resource use at the New York State demonstration sites than across a nationwide sample of clinics treating Medicare patients. Alternatively, estimated variation in the NYS data may be reduced by inaccurate measures of resource costs as described in the preceding chapter.

The ICD-9 codes did no better than an R^2 of 0.126, and the DSCs' highest R^2 was 0.043. Although- the PAC has fewer groups, it most likely does better in explaining overall variance because the PAC system goes beyond the clinically meaningful classifications to explicitly combine categories where resource use is similar. And probably more important, the PAC system then splits these patient classes into management and diagnostic categories with the intention of distinguishing between visits requiring substantial resource input and less resource-intensive visits.

Winners and Losers Under a National PAC System

If the PAC system were implemented using the mean national total combined payments as the payment schedule for each PAC, there would be substantial “winners” and “losers” across hospital outpatient departments. Since all claims in each PAC would be paid the same, hospitals with higher than average combined payments under the current system would be “losers” and those outpatient departments where payments are now lower than the national average within each PAC would be “winners.”

To examine this issue, the analysis compared the average dollar amount per claim (including the physician allowed charges and the OPD facility charge adjusted by the cost-to-charge ratio) for hospitals with specific sets of characteristics with the PAC payment amount for each group. A single national PAC payment figure was calculated by using the national average combined payment amount for all claims in each PAC. Therefore, any observed differences in PAC payments across hospital characteristics are attributable to variation in the distribution of PAC groups.

The gain or loss for hospitals with given characteristics represents the difference between these two payment averages. Gainers would receive a higher payment under a national PAC payment system than they currently earn. Hospitals were grouped by several different characteristics with the following results:

- Sharp differences exist between gainers and losers when hospitals are grouped by location. Northeast hospitals would gain a 6.1 percent increase in payment levels. In contrast, hospitals in the West would suffer a 14.4 percent decline in payment.
- When looking at urban/rural differences, the non-metropolitan statistical area hospitals would gain the most from PACs, increasing their payments by about \$17 per claim on average. Hospitals in metropolitan statistical areas with populations of more than a million would lose \$13.68 per claim.
- Hospitals with smaller bed sizes are gainers. In addition, sole community, disproportionate share and rural referral hospitals all would show substantial gains under this national PAC system.
- When the combination of bed size and location is taken into account, the findings on bed size (where smaller hospitals have greater gains) remain reasonably consistent by region, although some of the differences are mitigated particularly in the South and West. In the South, the trend is slightly reversed for medium-sized hospitals as hospitals with 200 to 299

beds gain slightly more than smaller 100 to 199 bed hospitals. In the West, the three largest groupings of hospitals by bed size show similar average losses.

- The combination of metropolitan statistical area and hospital bed size results in some considerable deviation in the bed size pattern. Within each metropolitan statistical area, the largest hospitals are not the largest (relative) losers. And in metropolitan areas with 250,000 to 1,000,000 people, the smallest hospitals are the only group to lose on average.

Conclusions

Five criteria were used to examine the issue of whether the PAC system could be used with the Medicare program: administrative simplicity, appropriateness, reduction in variance, stability, and the absence of undesirable provider incentives.

Administrative simplicity. Because the PAC system philosophy and application are quite different than those of the Medicare system, a number of important adjustments would be necessary to adapt the PAC system to Medicare. The first of these results from the bundled payment for the facility and physician components. Currently, Medicare reimburses for technical and professional services under separate reimbursement systems using totally different billing systems. Thus, a bundled payment would require considerable administrative changes for both program administrators and providers. Also, in order to correctly categorize Medicare claims into PAC groups, additional data elements would be needed on outpatient bills. While the PAC system does not require a great deal of data and seems to be manageable by the demonstration facilities in New York State, that simplicity could not automatically be transferred to Medicare. Once in place, however, it would be a simple, readily understood system.

Appropriateness. An appropriate system will group patients into categories that are meaningful for Medicare beneficiaries. The PAC system does a good job of categorizing Medicare services. No patient types or visit types are systematically excluded and claims group correctly according to the system's logic. Not all the groups are useful for the Medicare program, however. The findings indicate that 10 PAC groups account for more than 97 percent of all claims. A large proportion of elderly patients fall into Classes II and III of the PAC

grouping system, and even more significantly, they are much more likely to be grouped in the diagnostic categories, accounting for a far greater emphasis on these PACs than was envisioned in the New York system. Some PACs may be used too intensively to distinguish well the resources necessary to treat these patients. Thus, the PAC system would require some further modification if it were to be applied to the Medicare population.

Reduction in Variance. The primary purpose of a classification system is to categorize cases so that variation within groups is minimized and variation across groups is maximized. That is why the most problematic **finding** from the analysis was the small amount of the variation in total combined payments that the PACs system explains for the Medicare data. These findings are at odds with the amount of variation explained when the system was tested on patients of all ages in New York. Some refinement of selected PACs might be necessary if this system is to be used by the Medicare program. Overall the PAC system was found to explain roughly 24 percent of observed variation in outpatient costs. However, while this limited level of cost variation explained by the PAC system is a concern, it appears the results are within the realm of reasonable expectations. When the basic building block of a medical grouping system (ICD-9 diagnosis codes) is used, it explains less cost variation than the PAC system does.

Stability and Provider Incentives. A stable payment system should be one which is not easy to “game” -- to move across groups for the sole purpose of increasing payment. Moreover, the system should not create incentives for undesirable behavior. Perhaps the most problematic issue concerns the incentives facing providers to undertake a key technology to move patients from the management to the diagnostic category with a given class of service. To discourage this, the rate structure must be carefully set so that providers do not find it profitable to provide unnecessary ancillary services in order to change a PAC group assignment. Another issue is whether the PAC system would create incentives for shifting the site of care. For example, if referred ancillaries continue to be reimbursed on a cost basis, hospital outpatient departments might face very different incentives depending on whether the PAC payments are relatively generous as compared to the costs they could be reimbursed for from referred ancillaries. These incentives might affect the size of their clinics over time and their willingness to accept (or

encourage) referred **ancillaries** . **Thus**, a bundled payment system, if applied to only one ambulatory care setting may create new and perhaps undesirable incentives for shifting the way ambulatory care is delivered in the United States. At the least, payment levels in the different payment programs would need to be carefully coordinated.

CHAPTER 5

SUMMARY/LESSONS LEARNED

Administrative Feasibility

The administrative feasibility of the PAC system was examined through case studies of the implementation and operations of eight PAC project demonstration sites. These case studies found that while implementation affected several operational areas within the facilities, all were successful in implementing the demonstration. Facilities had to meet three requirements before the PAC system could be properly implemented. First, facilities had to collect the data needed for the PAC grouper software and to collect some additional data elements required for PAC evaluation. Second, in accepting financial responsibility for ancillary services, facilities had to make arrangements to be billed directly for non-key and key technology services that were performed outside of the facility or by non-facility personnel. Third, facilities had to confirm the provision of key technology services prior to processing a visit through the PAC grouper software and submitting a claim.

Several lessons were learned from the experiences of the demonstration facilities as they worked to meet these requirements:

- The ease with which a facility was able to match services with visits was highly dependent on the existing patient accounting (ID) system. This task was much more difficult where a patient was assigned a unique number for every visit and ancillary service performed.
- Encounter forms at most facilities required some modification to capture the necessary data elements; absent the need for evaluation data, however, modification would have been minor.
- Installation of the PAC grouper was dependent on the flexibility and sophistication of the facility's data processing system. The level of integration of patient registration information with encounter and ancillary services data was critical to PAC assignment.
- Facilities arranged contracts for ancillary services (both technical and professional) using existing relationships. Payment to vendors was generally based on previous payment levels. In general, facilities did not monitor vendors closely to determine whether duplicate billing was occurring.

- Two approaches were undertaken to bundle ancillary services with the visit: 1) the adoption of a suspense period; and 2) **direct** billing of Medicaid with quarterly “sweeps. ” It is not clear which approach is better, although the quarterly sweep may encourage a higher rate of claims resubmissions for adjustment billing. Further, the preferred system for the state may be different than that for facilities (which have concerns about reduced cash flow).
- Facilities reported limited ability to “game”, or “upcode”, the PAC system.
- None of the facilities reported using **PACs** as a management tool, either for monitoring utilization trends or physician behavior.

While the administrative experiences of the demonstration facilities suggest that **PACs** can be implemented on a broader basis, the facilities acknowledged that reimbursement under **PACs** affected only a small proportion of a facility’s revenue. If **PACs** reimbursement were to affect a larger percentage of patients, different behavior may result.

Practice Patterns

Simple univariate analysis of the **PACs** evaluation data collected at demonstration facilities suggests that substantial increases in ancillary service provision occurred during the demonstration evaluation period. In addition, usage of primary care physicians (instead of specialists or non-physician providers) increased. However, it is unclear whether any of these trends are attributable to the demonstration, since no control data existed for comparison purposes.

Multivariate regression analyses confirm the trends observed in the simpler descriptive analysis described above. However, the regressions also suggest that any observed changes are unlikely to be the result of the demonstration. The trends are not particularly pronounced (and are, in some cases, even reversed) for the Medicaid population of patients, for whom the strongest demonstration effects would be expected.

Usefulness of PAC Grouping

The **PAC** grouping algorithm **successfully explains 66** percent of the variation in measured costs across New York State demonstration providers. This is a considerably higher

proportion than what **DRGs** typically explain, however, it is not clear that the NYS data accurately depict the true underlying variation in resource costs.

There is considerable variation across **PACs** in the underlying homogeneity of the patient visits. Coefficients of variation of total costs range from 37 to 147 percent. Variation in ancillary costs is similar, while measured variation in labor costs is considerably lower because of the broad time intervals used to measure provider resource use. In general, the highest cost **PACs** evidence the lowest variation. **PACs** with coefficients of variation exceeding 100 percent have a mean cost of \$31, while those with lower **CVs** average \$103 in resource costs. **PAC 24**, which includes all CT and MRI scans, has the minimum coefficient of variation.

When applied to the New York state population utilizing demonstration facilities, the current **PAC** system does not appear to have any redundant groupings. While the evaluation data suggest that the original classification of pre-natal visits according to maternal age was not useful, New York State has since modified this classification into a high/low risk **diagnostic**-based differentiation which is likely to be more appropriate.

As the analysis of Medicare data suggests, however, if **PACs** were applied to other populations, it would probably be necessary to alter somewhat the classification system. Some **PAC** groups could probably be consolidated while others would need to be subdivided.

Potential Improvements to **PACs** Development & Implementation

As the data analysis chapter suggested, most of the **PACs** groupings exhibited reasonable internal homogeneity while being distinguishable from neighboring groupings. The noted exceptions were the two pre-natal **PACs** (10 and 11) which were defined on the basis of age. In this situation, age appears not to be a useful distinguishing characteristic; visits classified in the two pre-natal **PACs** were very similar. New York State has since implemented a potentially more useful classification system based on patient risk factors.

A potential problem also existed in the pricing of the **PAC** component. Prices were calculated on the basis of fee schedules for ancillary services and wage surveys and estimated time requirements for labor services. The most questionable component of this pricing scheme is the estimated time component. Data were collected using broad time intervals, e.g. 6-15 minutes, so that a visit requiring 6 minutes on average received the same payment as one requiring 15 minutes, or two and one half times the labor effort. Given the data collection

method, there is no way to determine the significance of this potential problem. However, more precise collection of time data would be useful and not particularly burdensome to providers (involving recording a single number in lieu of checking a box that indicates a time interval). As PAC prices are rebased, efforts should be made to increase the accuracy of the time data underlying the prices.

Finally, site visits with providers indicated few problems with implementation of PACs as indicated in the case study report. However, all sites with whom we spoke indicated that they would like to see the mandated evaluation data they collected used to provide feedback. All reported that they had received no regular reports from the State summarizing findings from the data collection effort. Useful feedback would compare each site with its peers. Site administrators felt that PACs had done little to modify the behavior of clinicians, but that with appropriate data, beneficial changes might be possible.

Applicability to Medicare

Five criteria were used to evaluate the PAC system's applicability to Medicare: the appropriateness of the system to the Medicare program, the administrative complexity of the system, the extent to which it explains variation in resource use, the stability of the system and provider incentives.

Appropriateness. The PAC system does a good job of categorizing Medicare services -- no patient or visit types were systematically excluded. Not all the groups were useful, however. The analysis found that 10 PAC groups accounted for more than **97 percent** of all Medicare claims. It is likely that the PAC system would require some further modification if it were to be applied to the Medicare population.

Administrative Simplicity. While the PAC system is a relatively straightforward, easily understandable approach to the classification of outpatient medical services, it does incorporate some concepts that would be new to the Medicare program and would thus require administrative changes. The first of these is the bundled payment for the facility and physician components. Currently, Medicare reimburses for technical and professional services under separate reimbursement systems using totally different billing systems. Thus, a bundled system

would require substantial administrative changes for both program administrators and providers. Also, as it did with the PAC project demonstration sites, bundling of ancillaries would require outpatient departments to make administrative changes in their current billing practices. Finally, in order to correctly categorize Medicare claims into PAC groups, additional data elements would need to be added to the outpatient bills in order to ensure a more accurate bundling of services.

Reductions in variance. Coefficients of variation (CVs) were calculated for individual PAC groupings to measure empirically the extent to which the categorization of cases minimized within group variation and maximized across group variation. CVs for PAC groups ranged from 0.51 to 1.28. Seven of the nineteen PACs had CVs in excess of 1. Among the four largest PAC groups (PACs 7, 8, 15, 16), the CVs ranged from 0.70 to 1.06. Thus, some refinement of selected PACs may be necessary. The overall explained variance achieved by the model appeared to be within range of reasonable expectations. The PAC system was found to explain roughly 24 percent of observed variation in outpatient costs of Medicare patients which is considerably lower than what a comparable analysis of the NYS evaluation data suggested. By going beyond the clinically meaningful ICD-g-based classifications to explicitly identify resource use through a diagnostic/management group split, the PACs achieved greater explanatory power than either the ICD-9 codes or diagnostic service categories.

Stability and Provider Incentives. The relative stability of a system is dependent upon the ease with which new technologies or practice patterns can be incorporated into the system, as well as the relative ability to “game” the system. The PAC system, with its broad groupings, should easily adapt to changes in technology or practice patterns. Since each PAC group is defined by relatively broad body system categories, and the number of PAC groups is small, the ability to move across PACs by patient class is limited. However, within these patient classes it is relatively easy to move from a management PAC to a diagnostic PAC simply by providing one of the key technology procedures. The rate structure must be carefully set so that providers do not have an incentive to provide unnecessary ancillary services in order to change a PAC group assignment.

Conclusion

The New York State Department of Health undertook an ambitious and potentially valuable project in attempting to design a payment system that bundles provider and facility costs into a single prospectively-determined fee. Such a bundling approach counters current incentives to bill for as many individual services as possible in order to maximize revenues. The State appears to have implemented a workable system in a number of demonstration sites, Administrative aspects of implementation appear relatively straight-forward.

For several reasons, it is difficult to determine the long run effects of the payment system on practice patterns or quality of care. First, the demonstration is relatively new, and both the case studies and the data analysis addressed only the first year to year and one half of the program. Furthermore, the evaluation did not permit any direct comparisons with control sites. Finally, most demonstration facilities had already been receiving capped rates prior to the demonstration and so had effectively been operating under a prospective rate system prior to the demonstration. Implementation of the **PACs** reimbursement system might be expected to have more noticeable effects on clinicians at facilities currently receiving cost-based reimbursement.

The PAC classification system seems reasonably appropriate for the population on which it was directly tested. Application of the PAC grouper to a Medicare sample, however, suggests that, while the grouping software is readily adaptable, some modifications to the classification system would probably improve the amount of cost variation it is able to explain.

APPENDIX1 .

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Evaluation of the New York
State PAC Project:

Case Study of
PACs Implementation

Contract No. 500-87-0030(3)

May 13, 1991

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1.0 OVERVIEW

This report examines the implementation of a case-mix adjusted prospective payment system for outpatient services in New York State (NYS). Under a cooperative agreement with the Health Care Financing Administration, the NYS Department of Health (OH) designed a case-mix patient classification system for ambulatory care. The Products of Ambulatory Care (PACs) is based on the concept of bundling together related medical services typically received by specific groups of patients, incorporating all the labor and ancillary services related to one visit. Reimbursement under PACs was designed to include not only the physician-related component, but also the facility costs associated with a given visit.

NYS received a Medicaid waiver to test the PAC classification system in nine demonstration hospital outpatient clinics and eight free-standing health center clinics within the Rochester, Northeast New York, and New York City areas. These ambulatory care programs represent about 11 percent of all Medicaid visits and 12 percent of all ambulatory care visits occurring in New York.¹ Facilities were phased onto the PACs System over an eight month period beginning in December 1987. PACs became the basis for reimbursing all demonstration facilities for Medicaid visits during 1988.

1.1 Background

While the introduction of DRGs in 1984 has successfully slowed the rate of inflation of hospital costs for inpatient care, payment for outpatient care has remained essentially cost-based or fee-for-service. The result has been a large increase in the volume and cost of ambulatory care which has partially offset the savings achieved in the inpatient setting.² To address this concern, the Omnibus Budget Reconciliation Act (OBRA) of 1986 stipulated that HCFA provide a report to Congress on a prospective payment system for the facility cost of hospital-based ambulatory care.

OBRA of 1986 includes several mandates regarding prospective payment for ambulatory care. The initial mandate is limited to surgical services conducted in either hospital outpatient departments or ambulatory surgery centers. The legislation originally mandated that a full prospective payment mechanism be in place by October 1, 1989 for surgical services. However, an interim system is in place pending development of a final prospective payment system. Extension of the prospective payment

¹Report to the Legislature, March 31, 1989. New York State Department of Health, Office of Health Systems Management.

²Mitchell, J.B.; G. Wedig, and J. Cromwell. "The Medicare Physician Fee Freeze." Health Affairs, Vol.8;pg.21-33; Spring 1989.

methodology to all hospital outpatient ambulatory care provided to Medicare beneficiaries is required by 1991.

The development and demonstration of the PACs system is one of several efforts undertaken by HCFA to meet its mandate to develop a prospective payment methodology for all non-surgical outpatient services. Other efforts are primarily focusing on the development and feasibility of Ambulatory Patient Groups (APGs), a system similar in concept and design to the inpatient DRG system.³ However, only the PAC system has actual experience in implementation and reimbursement. As the first state in the nation to reimburse on a case-mix adjusted prospective basis for ambulatory care⁴, the NYS experience offers valuable lessons for HCFA and other payors, as well as outpatient care facilities, in anticipating the impacts and changes required to implement a prospective payment system for ambulatory care.

1.2 Ambulatory Care in New York State

Institutional ambulatory care, particularly hospital-based care, is more extensive in New York State than in other states. On a national basis, close to 13 percent of ambulatory care visits are hospital outpatient visits. In New York state, 20 percent of the 85.7 million annual ambulatory visits are to hospitals.⁵

On a per capita basis, residents in New York City rely much more heavily on institutional ambulatory care than do residents elsewhere in the state. New York City generates an annual average of 2.1 institutional ambulatory visits person while the corresponding figure for the remainder of the state is .8 visits per person per year. New York City also relies heavily on municipal hospitals for ambulatory care. Approximately half of the hospital ambulatory care visits in New York City are to the 11 municipal hospitals; the corresponding national average 28 percent. These data suggest that a great deal of routine care is delivered through hospital outpatient departments.

³APGs are being developed under a HCFA grant to Health Systems International. The Urban Institute and Brandeis University are also under contract with HCFA to assess the APG classification system.

⁴Nine states and the District of Columbia have moved to some form of prospective payment system. None of these, however, account for differences in case-mix. "State Systems for Hospital Payments," Susan S. Laudicina, Intergovernmental Health Policy Project, the George Washington University, April 1989, p. 18.

⁵New York State Ambulatory Care Demonstration Initiative, Report to the Legislature, New York State Department of Health, Office of Health systems Management, March 31, 1990.

New York State has a greater proportion of large hospitals than the rest of the country, regardless of whether ambulatory services are available. Outpatient clinics tend to be associated with large hospitals, teaching hospitals, and those located in large metropolitan areas.⁶ Clinic services range from primary care to highly specialized services. Of the 245 acute care general hospitals in the state, 62 percent have organized outpatient clinics. This figure is higher (73 %) in New York City where there are numerous large, teaching hospitals. Overall, an estimated 8.8 million visits were made to hospital clinics in the state in 1983. This figure does not include referred ambulatory visits in which patients are referred to hospitals for special services (e.g., CAT Scan) not available in a private physician's office.⁷ The number of visits to hospital clinics is probably higher now.

Ambulatory care in New York State is also delivered through freestanding health centers, often referred to as "diagnostic and treatment centers (D&Ts)". There are over 365 freestanding diagnostic and treatment centers in the state, ranging from those classified as comprehensive primary care centers (102), to family planning (55 centers), abortion, cerebral palsy, rehabilitation, hemodialysis, speech and hearing, dental, methadone maintenance, child health, drug free, and other miscellaneous programs. Some 6.7 million visits are made annually to these clinics, with the comprehensive primary care clinics accounting for over 60 percent of the visits. Total annual costs for all freestanding programs are approximately \$500 million, with one-half of these costs accounted for by primary care programs.* Section 303 under the Public Health Service Act provides the major source of federal funding allowing these freestanding centers to fund community services such as outreach, patient education, environmental health activities, transportation, home care, and preventive services.⁹

Prior to PAC development, about one-third of all visits to hospitals and D&Ts were by Medicaid recipients (see Exhibit I-1). Fifteen percent and nine percent of the visits to hospital clinics and D&Ts, respectively, were by Medicare beneficiaries. Not surprisingly, a higher proportion of ambulatory visits to hospitals and health centers were made by Medicaid recipients in New York City.

⁶"Applying PACs to Medicare: A Comparison of Outpatient Settings in New York and the Rest of the U.S.", M. Moon; et. al., Urban Institute, March 1990.

^{*}New York State Ambulatory Care Reimbursement Project Grant Proposal. Office of Health Systems Management. New York State Department of Health, Division of Health Care Financing. December 30, 1983, p. 15.

⁸New York State Ambulatory Care Demonstration Initiatives, Report to the Legislature, New York State Department of Health, Office of Health Systems Management, March 31, 1990. (pg.5-6)

⁹Op cit

Exhibit 1-1

Percentage of Visits by Payor

	<u>Medicaid</u>	<u>Medicare</u>	<u>Other</u>
Hospital Clinics (a)			
Statewide	37%	15%	48%
NYC	41%	15%	44%
D&Ts (b)			
Statewide	31%	9%	60%
NYC	37%	10%	53%

(a) 1980

(b) 1978; Multi-service centers only

Source: New York Council on Health Care Financing. Data derived from statistics reported in the 1980 Supplements to the Institutional Cost Report submitted to the New York State Department of Health.

1.3 Medicaid Reimbursement for Ambulatory Care

It is important to note that two agencies have been involved in the development and administration of the PAC system in New York State. The administration of the Medicaid program, including operation and maintenance of the Medicaid Management Information System (MMIS), is the responsibility of the Department of Social Services (DSS). In fact, the grant funded by HCFA to develop and implement a case-mix reimbursement system for ambulatory care was awarded to DSS. However, given that the responsibility for collection and analysis of facility cost reports for ratesetting rests with the Department of Health (DOH), the actual development and implementation of the PACs reimbursement system was primarily undertaken by the Office of Health Systems Management within DOH.

Medicaid reimbursement for services rendered in both hospital outpatient departments and freestanding health centers in New York State is considered payment in full. The patient is not liable for any coinsurance or deductible. Total Medicaid program costs are shared by the federal, state, and local governments on an approximately 50 % / 25 % / 25 % cost sharing basis, respectively.

Reimbursement to non-demonstration hospital outpatient departments for services rendered under the New York Title XIX (Medicaid) State Plan is based on a prospective, average cost per visit basis. Since 1981, all hospital outpatient per visit payments have been held to the lower of a provider's cost or a per visit ceiling price (\$60 for operating costs plus an allowance for reported capital costs). The \$60 ceiling has been the effective payment rate for most facilities. Subsequent reports will address the validity of the PACs system, its impacts on Medicaid utilization and outlays, and the potential for Medicare application.

Reimbursement to non-demonstration diagnostic and treatment centers for services provided to Medicaid clients is also based on a prospective average cost per visit basis subject to various limits. Under the current methodology, a facility's costs are divided into three cost centers (administrative, medical, and transportation). The average per visit cost for each center is then compared to the weighted average per visit cost for peer group facilities (peer groups are defined by region and services offered). Each facility is then held to a ceiling of 105% of the peer group average for each cost center.

While ambulatory care services have steadily represented about 10 percent of Medicaid expenditures in New York State, the rate of growth between 1978 and 1988 has been substantial. As shown in Exhibit 1-2, total Medicaid expenditures for ambulatory care provided in hospital outpatient departments and freestanding clinics has more than doubled, from \$297 million to \$770 million over the ten-year period. The majority (over 60%) of these expenditures have been for hospital ambulatory services. However, as can be seen in the exhibit, the proportion expended for services provided in freestanding centers has been steadily increasing, from 25 percent in 1978 to 35 percent in 1988.

Exhibit 1-2

**Medical Assistance Expenditures for New York State
and New York City**

<u>New York State</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>
Total Ambulatory Expenditures (a)	297	315	370	460	522	585	639	694	755	764	770
Hospital	74.9%	69.9%	71.3%	71.5%	69.2%	68.0%	68.6%	68.1%	66.5%	66.0%	65.4%
D&T	25.1%	30.1%	28.7%	28.5%	30.8%	32.0%	31.4%	31.9%	33.5%	34.0%	34.6%
<u>New York City</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>
Total Ambulatory Expenditures (a)	236	249	290	362	3%	431	459	506	541	540	519
Hospital	79.2%	71.3%	72.9%	72.8%	72.2%	70.5%	70.1%	69.4%	67.9%	68.0%	68.7%
D&T	20.8%	28.7%	27.1%	27.2%	27.8%	29.5%	29.9%	30.6%	32.1%	32.0%	31.3%

(a) Expenditures expressed in millions of dollars

Source: Statistical Supplement to the 1988 Annual Report; New York State Department of Social Services

1.4 Methodology

To date, no study has examined the impacts of the **PACs** system or addressed the validity of the classification system. In 1988, HCFA awarded Abt Associates Inc., and its subcontractor, the Urban Institute, a contract to evaluate the feasibility and impacts of the **PACs** system. The first phase of this evaluation addresses the former goal. This report describes the state's efforts in the development of the system and the implementation experience with the **PACs** classification scheme and reimbursement methodology. As such, this report is qualitative in nature, relying on a case study approach to gather information from NYS DOH staff and a sample of demonstration facilities. Subsequent reports will address the validity of the PAC classification matrix, its impacts on Medicaid utilization and outlays, and the potential for Medicare application".

Specifically, we conducted personal interviews with NYS DOH staff responsible for the development and maintenance of the PAC system, and attended several advisory group meetings in which ongoing developmental and implementation issues were discussed. In addition, site visits to a sample of demonstration facilities' were conducted in the winter and spring of 1990. In all, we visited five of the nine hospitals and three of the eight community health centers participating in the demonstration. Given the timing of these site visits, facilities had at least one and a half years implementation experience under the PAC reimbursement system. Administrative staff who were interviewed included ambulatory care managers, clinic administrators, accounting or financial managers, and staff from a variety of departments, as appropriate, including medical records, data processing, and ancillary services (e.g., X-ray, laboratory).

A number of clinical staff were also interviewed. Typically, this included the medical director and nursing supervisor in the community health center settings. However, in the larger hospital settings, each clinic generally has its own medical director and/or nursing supervisor. As a result, we interviewed the medical director and nursing supervisor of selected clinics representing both high Medicaid volume (e.g., pediatrics, OB/GYN, etc.) and specialty care (e.g., oncology, ophthalmology, etc.) in order to gain an understanding of any differential impacts among clinics.

These interviews focused on the **PACs** implementation process and its impact on the delivery of ambulatory services in each facility including":

- * start-up/transition activities;
- * billing procedures and fiscal management;

"Preliminary observations from the evaluation data suggest considerable variation in the homogeneity of costs across the 24 **PACs**. Memo by Abt Associates, June 6, 1990.

¹¹The interview protocol can be found in Appendix A.

- * vendor arrangements;
- * key technology verification;
- * data processing functions;
- * PAC reporting procedures and interface with NYS DOH;
- * medical record functions;
- * patient registration and screening procedures; and,
- * clinical practice.

The findings from these interviews are reported in this report. Section 2.0 describes the state's efforts in the development of the PAC system as well as provides a description of the system itself. Section 3.0 discusses the implementation process, specifically at the state level; while Section 4.0 discusses the steps undertaken by demonstration facilities to implement PACs. Section 5.0 describes refinements to the PAC system, including recent initiatives for statewide implementation.

2.0 NEW YORK STATE AMBULATORY CARE PROJECT

The development of a case-mix prospective payment system required DOH to develop methodologies to measure case-mix and facility costs, as well as design a reimbursement methodology. This developmental work was performed within the DOH by staff specifically hired for the New York State Ambulatory Care Project. This section describes the development activities DOH undertook in designing the PAC system. The PAC reimbursement system, and its components, is also presented.

2.1 Develonmental Efforts

NYS DOH spent a considerable amount of effort in the development of the PAC system. Even before the award of the cooperative agreement, NYS staff worked with HCFA officials in the preparation of a grant application addressing HCFA's interest in the development and demonstration of an alternative payment system for outpatient care.¹² Finally, after a year of deliberations between NYS DOH and HCFA, a grant was awarded to NYS in September of 1984 to research and develop a prospective case-mix reimbursement system for ambulatory care.

NYS DOH stated several objectives in its development of a case-mix adjusted prospective payment system for ambulatory care:

- * to develop a comprehensive reliable ambulatory care service classification system for collecting, analyzing, and comparing resource use and cost data;
- * to finance services in an equitable and uniform manner for both hospital OPDs and D&Ts;
- * to replace a variety of maximum payment levels with a prospective reimbursement formula that acknowledges reasonable costs and adjusts for resource consumption due to case-mix severity; and,
- * to provide incentives for the economic delivery of ambulatory services.

The development of the PAC classification system and the reimbursement methodology took approximately 3 years to complete prior to its implementation in the 17 demonstration facilities. The DOH has undertaken several activities over the last six years:

¹²HCFA was especially interested in developing additional information about the payment for, and delivery of, services in organized ambulatory settings (i.e., hospital outpatient departments, other hospital-based ambulatory care units, and freestanding ambulatory care units). However, HCFA did not expressly state that the alternative payment system should be prospective in nature. See Federal Register Vo. 48, No. 218, November 9, 1983, pg. 51540.

- Year 1: Design research plan; prepare various option paper; develop data collection instruments and protocol;
- Year 2: Collect data and develop a preliminary service classification system and reimbursement methodology.
- Year 3: Finalize classification system and reimbursement methodology; prepare waiver application; prepare for demonstration implementation.
- Year 4: Implement **PACs** in 17 demonstration facilities and monitor all operational components of the demonstration; and develop an evaluation plan.
- Year 5: Design Products of Ambulatory Surgery (PAS); monitor **PACs** implementation; conduct special studies.
- Year 6: Initiate recalibration efforts; refine PAC assignment process, implement PAS statewide.

Six full-time staff were hired by the NYS Department of Health to begin work on the grant. Most of these staff had been working in other bureaus within the DOH and had experience with ambulatory care or ratesetting. However, at least one project member was recruited from the Department of Social Services and had direct experience with the Medicaid Management Information System (MMIS). An independent consultant was also hired who had significant experience working with several New York City hospitals and community health centers.

In addition to these core project staff, several provider advisory groups were formed to lend technical assistance to the project. A Clinical Advisory Group, composed of about 30 clinicians and clinic administrators from freestanding and hospital outpatient clinics advised DOH on clinical issues surrounding the clustering of ambulatory care products. A Research Advisory Panel, composed of national experts in the field of ambulatory care, provided DOH with a broader perspective on classification systems in general. A Management Advisory Group, composed of PAC-related management representatives from each of the participating facilities advised DOH on feasibility and operational aspects regarding PAC implementation. Finally, a Costing Advisory Panel was formed, composed of financial experts (e.g, financial **officers**), to assist DOH with costing ambulatory services.

As part of the research plan, several initial activities were undertaken to familiarize the project team with the various components of designing a classification system and a reimbursement methodology. For example, option papers were prepared discussing a number of issues including: a literature review related to ambulatory care and case-mix measures; pricing of ambulatory services; an overview of the NYS Medicaid MMIS systems and interfaces; and a summary of existing classification systems.

The largest obstacle to the development of a classification system based on **casemix** and resource use, however, was the fact that no database existed with sufficient detail to analyze patient

characteristics, diagnostic information, or provider characteristics. Thus, the first year was primarily devoted to designing and pre-testing data collection instruments that would enable the DOH to examine variables considered to affect case-mix variation across ambulatory visits. Several preliminary data collection efforts were undertaken to collect information on facility and staff characteristics, including operational information at the clinic (e.g., dermatology, obstetrics, orthopedics, etc.) level within large hospital-based ambulatory care facilities. Initial data collection efforts also focused on feasible and **efficient** methods to collect data on patients and the services they receive during a visit. After a number of pre-tests and refinements, the DOH finalized two data collection instruments for use in a sample of 33 facilities (15 hospitals and 18 community health centers) in two geographic areas (Bronx County and eight counties in northeastern New York) generally considered to be representative of New York State communities.

A Patient Visit Survey was designed to track resource use, as measured by ‘time and motion estimates’, during the patient’s visit. In particular, the total amount of direct and indirect (e.g., chart review) contact time associated with a given visit by clinical and administrative staff was recorded on the survey instrument (see Appendix B for a copy of the survey instrument). In addition, patient-specific demographic and diagnostic information was collected for each visit.

A Staff Survey was also designed to assess staff responsibilities, activities, and the training level of the health care professionals who have primary interaction with patients (e.g., physicians, physician assistants, nurses, etc.), as well as other clinicians (e.g., nutritionists, audiologists, pharmacists, social worker, etc.) who had direct contact with patients for whom visit surveys were completed.

2.1.1 Measuring Operational Cost Components

The Patient Visit Survey was administered during a two-month period in the second year of the grant for a sample of ambulatory encounters, regardless of payer, occurring in the 33 facilities. Although the field effort was short, DOH staff spent considerable time and effort preparing for the data collection. DOH staff visited each participating facility to review the project and the schedule for administering the visit survey. Fifteen data coordinators were hired to oversee the data collection in each facility and to serve as liaisons between the facility and DOH. Training of facility and clinic staff (i.e., staff physicians, nurses, and administrative personnel) was conducted to specify the procedures for completing the visit survey. The data coordinators were also responsible for administering the staff surveys.

Information on over 10,000 visits was collected. All diagnoses were coded into ICD-9-CM format and the ancillary tests and procedures were coded into CPT-4 codes. A standardized wage and salary scale (derived from Council of Teaching Hospitals 1984 salary schedules) was then applied to the time components of the ambulatory visit and standardized prices were attached to the ancillary

components (established from a commercial fee schedule) of each visit. The application of these standardized wage and price scales to each visit formed the basis from which resource patterns, independent of facility-specific costs, were examined.

2.1.2 Measuring Fixed Cost Components

Facility cost reports were subsequently used to estimate the fixed costs of providing ambulatory care. However, while diagnostic and treatment center cost reports were sufficient to estimate facility-specific costs (since, by definition, all services **are on** an outpatient basis), hospital cost reports contained minimal detail specific to outpatient services. In order to estimate hospital outpatient costs, **accounting stepdown** methods were applied to hospital cost reports to apportion hospital costs to the ambulatory setting.

While described in detail below, the final reimbursement methodology includes a PAC-specific case-mix price for each of the 24 clusters which does not change across facilities or clinical setting. A facility average per visit fee is then added, which is unique to each facility but constant for each visit within the facility. Thus, total ambulatory care revenue is computed as the sum across the 24 PACs of the product of the volume of visits in the PAC category and the rate established for the PAC.

2.2 PAC Classification Matrix

Using the data obtained from the visit survey, an ambulatory care service classification scheme was designed. Several parameters were used to guide its development. The system was required to be:

- * clinically meaningful;
- * administratively simple;
- * transparent to providers and patients;
- * based on routinely available data; and,
- * adaptable to a reimbursement methodology.

Through an interactive process of analysis, presentation, and discussion, a classification scheme was finalized in October 1986, about two years after the grant award. The final classification system includes a total of 24 clusters, each intended to represent an individual group of similar services provided to a generally similar group of patients (the classification matrix is described in detail below). As a result, The PACs system is based on two clusters of characteristics:

- * Patient Classes which describe similar patients with similar treatment patterns.
- * Service Categories which reflect the continuum of ambulatory care, from problem assessment and diagnosis, through treatment planning, intervention and management to follow-up and referral.

The **Patient Classes** represent a grouping scheme that categorizes patients according to their diagnostic and treatment characteristics. Patient diagnoses were initially grouped into 24 "clinically meaningful" Diagnostic Service Clusters (DSCs) according to similar ICD9-CM diagnosis codes and generally classified according to the affected body system (see Exhibit 2-1). Some of the DSCs were subsequently combined according to similarities in treatment and other patient characteristics, resulting in 10 final patient category groups. Exhibit 2-2 shows the general description of each patient class and the DSCs assigned to each. Thus, patients with similar diagnoses and patient characteristics are grouped into one of ten distinguishable Patient Classes.

Four **Service Categories** were developed to reflect similar resources required at different stages of the ambulatory visit to treat the patient condition:

Diagnostic Investigation: Visits under this category are usually the first phase of medical care and involve the initial identification of the patient's condition. For this reason, the provider may require more contact time with the patient as well as more ancillaries (e.g., laboratory testing) until the proper diagnosis is made. This service category includes the presence of 'key technology' services: CAT scans, nuclear imaging, stress tests, X-rays, EEGs, ultrasounds, chest X-rays, mammograms, and contrasts.

Therapy Management: Visits in which the actual treatment or therapy regimen is administered (based upon the diagnosis) are included in this category, including immunizations and medication. Provider contact time and ancillary use depend on the extent and frequency of treatment.

Problem Management: This category identifies visits in which progress and/or follow-up is conducted. These visits assess the patient's condition and allow the provider to modify or abandon any existing treatment if necessary. These visits require average provider contact time and often less laboratory testing. However, key technologies can be used.

Well Care: Visits for routine check-ups are included in this category. These visits are not initiated by health problems and can involve more ancillary use due to the different well care examination protocols.

The combination of the Patient Classes and the Service Categories results in a classification matrix reflecting differences in patient characteristics and the type of visit. As shown in Exhibit 2-3, 24 mutually exclusive PACs were developed from these patient classes and service categories (Appendix C provides more detailed definitions for each PAC). The classification matrix utilizes slightly over half of the available 40 PAC cells (10 patient classes and 4 service categories).

PAC assignment is performed by a computer algorithm based on nine variables:

- * Primary diagnosis
- * Secondary diagnosis

Exhibit 2-1

Diagnostic Service Categories

1	ARTH	Arthritis, rheumatism, and other inflammatory/degenerative diseases of the joints and bones
2	CIRC	Problems, injuries, and diseases of the heart and blood vessels
3	CONG	Congenital disorders of children and newborns with problems
4	EAR	Problems, injuries, and diseases of the ear
5	END0	Diabetes and other metabolic problems and diseases of the endocrine system and pancreas
6	EYE	Problems, injuries, and diseases of the eye
7	GI	Problems, injuries, and diseases of the digestive, hepatobiliary systems
8	ID	Systemic infections or multi-organ/multi-body system infections
9	MIADA	Mental and social problems, alcohol and drug abuse
10	MUSC	Problems, injuries, and diseases of the musculoskeletal system (excluding inflammatory and degenerative bone diseases)
11	NBFETAL	Problems, injuries, and diseases attributable to newborn or fetus
12	NEURO	Problems, injuries, and diseases of the nervous system
13	NUTR	Simple deficiency anemias and other nutritional deficiencies
14	ONCO-HEM0	Malignancies (excluding benign tumors and malignancy of the skin) myeloproliferative diseases of the blood and blood-forming organs (except simple anemias)
15	PREG	Confirmed pregnancy
16	REHAB	Rehabilitation services
17	REPRO	Problems, injuries, and diseases of the male/female reproductive systems
18	RESP	Problems, injuries, and diseases of the nose, throat, lungs, oral cavity and naso-pharynx
19		Reserved
20	SKIN	Problems, injuries, and diseases related to the skin, including malignancies
21	NOS	Not otherwise specified (non-specific symptoms) system
22	UROL	Problems, injuries, and diseases of the kidneys and urinary tract
23	WELL CARE	Well baby care, annual physical exams of children and adults
24	MED ADMIN	Vaccinations, prophylactic injections, prescription refills
25	PINJ	Poisonings, non-specific acute injuries

Source: New York State Ambulatory Care Case Mix Research and Demonstration Project, New York State Department of Health, 1987.

Exhibit 2-2

Patient Category Groups

Patient Category Groups	General Description	Age Restrictions	Component DSC #s
Class 1	General Child Care	0 --> 17	4, 6, 7, 8, 10, 12, 17, 18, 19, 21, 23
Class 2	General Adult Care	Over 17	4, 6, 8, 10, 12, 17, 18, 19, 21, 23
Pregnancy	Pregnancy Care	-----	14, 24 (a)
Reproductive	Reproductive Care	-----	16
Class 3	Adult and Child Non-Routine Care	—	1, 2, 3, 5, 7, 9, 11, 15, 20, 25, 24 (b)
Class 4	Oncology Care	-----	13
All Patients	Service Driven Care: Mec. Med. & DRMs Adm.	-----	22
Speech/Rehab/ Hearing	Service Driven Care: Audiology Rehab & Hearing	-----	15
Class 5	Mental Illness Care	-----	9
Ophthalmological	Eyecare	-----	6

(a) If DSC is coded for Mother

(b) If DSC is coded for Child

Source: New York State Ambulatory Care Case Mix Research and Demonstration Project, New York State Department of Health, 1987.

Class 1: Children under 18 with problems in the following areas: muscle skeletal, nutritional, ear, nasopharynx, respiratory, gastrointestinal, skin, infections, and injuries.

Class 2: Patients over 17 with problems in the following areas: muscle skeletal, nutritional, ear, nasopharynx, respiratory, gastrointestinal, skin, infections, and injuries.

Class 3: Patients with problems in the following areas: adult digestive, hepatobiliary, nervous, circulatory and urological systems, arthritis, rheumatism and other inflammatory/degenerative diseases of the joints and bones, diabetes and other metabolic problems and diseases of the endocrine system and pancreas, congenital disorders and newborns with problems, patients with medical problems attendant to mental illness, substance abuse, social problems, and physical medicine.

Class 4: Patients with malignancies (excluding benign tumors and malignancies of the skin), myeloproliferative diseases of the blood and blood forming organs (except simple anemias).

Class 5: Patients with diagnosed mental illness or substance abuse problems.

Products of Ambulatory Care Classification Matrix

Patient Classes		Diagnostic Investigation	Therapies	Problem Management	Well Care
	Class I	Class I diagnostic examination PAC #3		Class I management PAC #4	Child well care PACs #1 & 2
	Class II	Class II diagnostic examination PAC #7		Class II management PAC #8	Adult well care PAC #6
	Pregnant Women	1st visit prenatal PAC #9		Prenatal I PAC #10	Prenatal II PAC #11
	Reproductive Care	Reproductive diagnostic examination PAC #13		Reproductive management PAC #14	Routine gynecological examination PAC #12
	Class III	Class III diagnostic examination PAC #15		Class III management PAC #16	
	Class IV	Class IV diagnostic examination PAC #17	Chemotherapy/ Radiotherapy PAC #18	Class IV management	
	Class V		Class V Therapy PAC #20		
	Any Patient	Diagnostic examination with NUC, CAT PAC #24	Medication Administration PAC #5		
	Speech and Rehabilitation	Audio examination PAC #21	Speech and Rehabilitation PAC #23		
	Ophthalmology	Ophthalmology diagnostic PAC #22			
		Service Categories			

- * Age
- * Sex
- * Provider type (e.g., audiologist)
- * Clinic type (e.g., ophthalmology)
- * Visit type (old/new patient)
- * Administration of drugs
- * Ancillary tests provided

A more detailed discussion of the PAC assignment process is presented in Section 3.3.

2.3 Reimbursement Methodology

Two objectives guided the development of a reimbursement methodology:

- * the methodology must be applicable to both hospitals and diagnostic and treatment centers; and,
- * comparable costs must be included in the same cost centers, regardless of facility type.

However, the inconsistency in accounting practices, such as the definition of cost centers between hospitals and freestanding programs, required DOH to develop a standardized cost center matrix.

The PAC reimbursement methodology is based on a single, uniform, prospective price for all demonstration facilities. A fixed price is established for each PAC. As noted earlier and shown in Exhibit 2-4, the PAC rate is determined from two components:

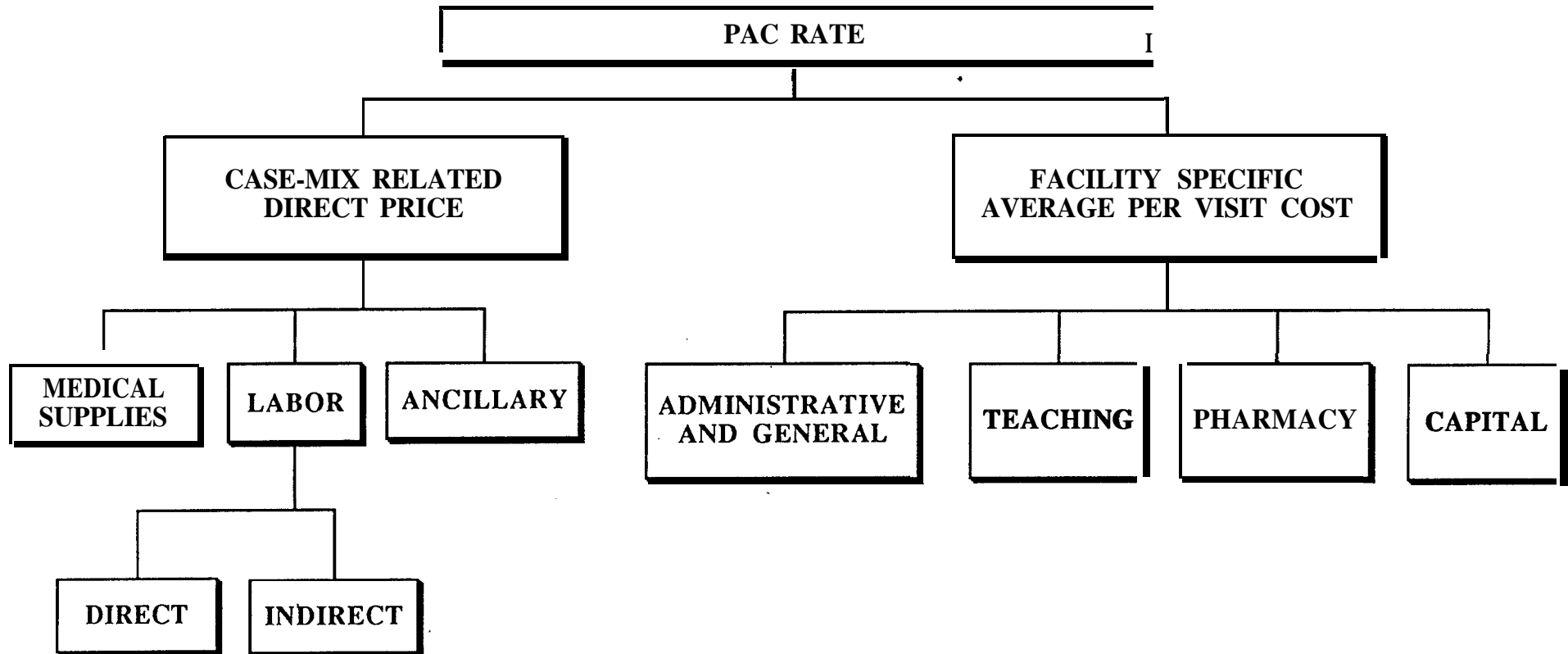
- * Case-mix Related Direct Price, which reflects the average cost of labor and ancillary services for a given visit in a PAC.
- * Facility-Specific Average Per Visit Cost, which reflects individual facility costs, including operational costs, teaching, pharmacy, and capital costs.

2.3.1 Case-mix Related Direct Price

The case-mix related direct price includes labor costs, ancillary service expenses and the costs for medical supplies. Because each of these components varies with the services rendered to patients, these costs are reimbursed on a case-mix prospective basis. The labor component accounts for both direct and indirect patient contact time, and the ancillary component accounts for the price of ancillary services such as X-rays and other laboratory testing.

Exhibit 2-4

Components of PAC Reimbursement



Direct labor costs are based on the professional staff values for services rendered directly to the patient. These values comprise a per-minute value for the patient contact time provided by physicians, nurses, therapy personnel, and clerical and support staff. The per-minute fee is based on appropriate salary and wage levels representative of the demonstration areas and is multiplied by the actual number of contact minutes to produce a final labor fee for direct patient care. However, because the health care staff must also spend time organizing and reviewing patient records, the labor cost component also includes staff time spent on an indirect contact basis. For the primary providers, the per-minute value is increased by 33 percent to account for this indirect contact time. An adjustment to account for 'down time' (e.g., vacation, sick days, etc.) and medical supplies was also included. Based on estimates in the literature, the direct labor price was increased by 50 percent for these two components. This adjusted direct contact value is the overall labor component of the case-mix related direct price.

While a commercial fee schedule was used for pricing specific ancillary services (based on CPT-4 coding), an average 'ancillary price was calculated for each PAC to reflect the ancillary service mix. This ancillary service component of the case-mix related direct price was somewhat more difficult to standardize than the labor component. Ancillary service expenses vary considerably with the size, capital stock and pricing behavior of a facility. To arrive at an estimate believed to best represent these service costs across all facilities in the demonstration area, DOH calculated a mean non-specific facility price based on four criteria: 1) all services included in the ancillary service component must be included in the CPT-4 coding scale; 2) the price must be representative of a broad range of ancillary services performed across all facilities; 3) the price must reflect technological advancement; and, 4) the price must be representative of demonstration area charges. The cost or price of each ancillary service (or test) was added for each sampled visit to give a per-visit price. All visit prices were then summed and divided by the number of visits to determine the final mean ancillary service price for each PAC. Thus, the case-mix component of payment is the same in every facility for a given PAC. Exhibit 2-5 presents the case-mix related price for each PAC. As shown, PAC 24 (CAT scans and nuclear imaging services) has the highest rate; and the diagnostic investigation PACs have higher rates than other PACs.

2.3.2 Facility-Specific Average Per Visit Cost

The fixed per visit facility fee includes an individual center's administrative and general costs, pharmacy costs, teaching costs and capital expenses. Because these costs vary only across facilities and not with the provision of services, the facility fee does not vary by patient category.

Exhibit 2-5

Case Mix-Related Price

<u>PAC</u> <u>Group</u>	<u>PAC</u> <u>Description</u>	<u>PAC</u> <u>Price</u>
1	Well Care, O-2	\$21.02
2	Annual Well Care Exam, 3-17	\$33.18
3	Diagnostic Investigation Class 1, O-17	\$90.95
4	Management Class 1	\$20.05
5	Medication Administration	\$9.43
6	Annual Well Care Exam, Over 17	\$45.17
7	Diagnostic Investigation Class 2, Over 17	\$129.86
8	Management Class 2, Over 17	\$25.14
9	Initial Prenatal Evaluation	\$140.76
10	Prenatal Revisit, Under 19/Over 34	\$50.65
11	Prenatal Revisit, 19 to 34	\$38.86
12	Annual Gynecological Exam	\$42.64
13	Diagnostic Investigation Reproductive	\$198.45
14	Management Reproductive	\$34.73
15	Diagnostic Investigation Class 3	\$182.42
16	Management Class 3	\$35.00
17	Diagnostic Investigation Class 4	\$159.17
18	Management of Chemo- and Radio-Therapies	\$82.30
19	Management Class 4	\$46.92
20	Management Class 5	\$27.90
21	Audiological Testing	\$21.38
22	Ophthalmological Services	\$21.30
23	Speech and Rehabilitation Therapies	\$22.76
24	CAT Scans and Nuclear Imaging	\$435.80

Source: New York State Department of Health Office of Health Systems
Management Report to Legislature, New York State
Ambulatory Care Case Mix Project, March 31, 1989

Administrative and general costs include plant and maintenance expenses. Facilities are peer-grouped by type (e.g., D&T, hospital) and an average per-visit facility cost is derived. The costs for each group are controlled by a ceiling placed at the 60th percentile.

Pharmacy costs include a facility's outpatient pharmacy operating expenses and the cost of the drugs administered during the patient's visit. These costs are fully reimbursed and considered to be a pass-through.

Teaching costs are reimbursed only for approved teaching programs under the current Medicaid regulations. These teaching costs are net of capital, and include the costs incurred in physician supervision of interns and residents. The costs are included in the facility fee on a per-visit basis and are also subject to a group ceiling at the 60th percentile.

Capital expenses include rent, interest payments and depreciation on buildings, fixtures, and equipment not included in other categories. Ancillary capital is not included here since it is already included in the ancillary component of the case-mix related direct price. Capital costs are reimbursed on an average per-visit pass through basis.

2.3.3 Total PAC Reimbursement

As mentioned above, the total PAC reimbursement is based on the sum of the case-mix related direct price (the mean ancillary service price and the labor price) and the facility-specific component. All data for the computation of the fixed PAC price were based on 1984 dollars. As a result, the price level for each of the project years 1987, 1988 and 1989 was adjusted with inflation rate forecasts from the New York State Panel of Health Economists. This adjustment allows each reimbursement level to be based on the project's current year prices. DOH has recently proposed several changes to the reimbursement methodology and updated some of the price components. These changes are discussed in Section 5.0.

2.4 Restrictions

The PACs system applies to certain services covered by Medicaid. In addition, there are some restrictions on frequency of billing for specific types of visits. As shown in Exhibit 2-6 the PAC classification scheme covers all mandated and optional services under Title XIX provided during a visit to an outpatient department or freestanding diagnostic and treatment center with the exception of: mental health services delivered in mental health clinics, drug treatment/detoxification services delivered in

Exhibit 2-6

Services Included Under PAC Demonstration

Included Services:

All clinic services provided in hospital-based outpatient departments or free standing diagnostic and treatment centers, including:

- Physician care
- Laboratory and radiology services
- Prescription drugs administered during the clinic visit or filled by the facility's pharmacy as a result of the clinic visit
- Family planning
- Podiatry
- Eye care (Opticians and Optometrists)
- Occupational/Physical/Rehabilitation therapy
- Audiology and speech services
- Social work counseling

Excluded Services:

- Emergency room care
- Alcohol and drug dependence care clinics (e.g. Methadone maintenance treatment)
- Psychiatric care clinics
- End Stage Renal Disease care clinics
- Ambulatory Surgery
- Dental Services

certified drug treatment programs, dental services, dialysis services, ambulatory surgery¹³, and emergency room services.¹⁴ DOH excluded these services because their service profiles (e.g., utilization, costs) tends to be very different than those services captured by the PAC system.

Furthermore, only visits originating in a clinic within a hospital or visits to an eligible diagnostic and treatment center are subject to the PAC system. Visits to a private physician's office are not included under PACs. Similarly, referred ambulatory visits to a hospital (e.g., a private physician sends a patient to the hospital for X-rays) are not included.

Prior to PACs, hospitals and freestanding clinics could only bill Medicaid for one clinic visit per recipient per day. Under PACs, this restriction was partially lifted. Facilities are allowed to bill a maximum of two clinic visits per recipient per day provided that only one of the visits is covered by the PAC reimbursement system and the second visit is for a non-covered service. Facilities are not allowed to bill for two PAC-reimbursable visits, nor for two non-covered services on the same day.¹⁵

In addition, three of the well care PACs (PACs 2,6,12) have an annual restriction. A facility can only bill each of these PACs once during a 12-month period for each of their Medicaid clients. If a Medicaid client receives one of these services more than once during a year, the second visit is billed to one of the problem management PACs, which receives lower reimbursement.

In order to bill for a diagnostic investigation visit (PACs 3,7,13,15,17) or bill for PAC 24, the facility must agree to be financially responsible for key technology services. If a facility intends to bill for any of the prenatal PACs (PACs 9,10,11), it must be financially responsible for all ultrasound provided to prenatal patients. A facility can participate in the demonstration if it chooses not to be financially responsible for key technologies; however, it will not be eligible to bill the PACs related to the service (e.g., diagnostic investigation PACs; PAC 24; or the prenatal PACs).

¹³As mentioned earlier, effective June 1990, NYS DOH implemented the Products of Ambulatory Surgery, a prospective payment reimbursement system for ambulatory surgery services provided to Medicaid recipients.

¹⁴Over 70 percent of the ambulatory care visits in New York State are subject to the PAC methodology. New York State Ambulatory Care Initiatives, Report to the Legislature, New York State Department of Health, Office of Health Management Systems, March 31, 1990.

¹⁵Visits that result in a direct inpatient admission can only be billed for the inpatient stay and are not eligible for reimbursement for the clinic visit. This was true prior to PACs as well.

3.0 STATE IMPLEMENTATION

The DOH undertook several activities to implement the PAC system, including:

- * recruit facilities for demonstrating the feasibility of the PAC system;
- * prepare and submit a waiver request from various Medicaid administrative and rules and regulations;
- * design a PAC grouper to logically assign visits into the appropriate PAC cell;
- * install the PAC grouper and provide training and technical assistance to demonstration providers.

Each of these activities are described below.

3.1 Facility Recruitment

Recruiting facilities to implement the PAC system began in the third year of the grant, after the development of the classification scheme and reimbursement system. The DOH targeted the 33 facilities that participated in the initial data collection phase of the project. Meetings with facility representatives were held to review the PAC system along with a discussion of the risks and benefits of participation. Aside from encouraging facilities to be involved in 'cutting edge' research on ambulatory care reimbursement, the DOH included a hold harmless provision of participation, providing for revenue-neutrality under the demonstration. This provision would be enacted if a facility's average revenue for covered PAC services was lower than the average Medicaid rate they would have received if they had not participated in the demonstration. In these instances, their PAC rates would be adjusted to eliminate the shortfall.

Of the 33 facilities in Bronx County and the eight counties in northeastern New York, only 10 (4 hospitals and 6 community health centers) ultimately decided to participate in the PACs demonstration. For the most part, those facilities that decided not to participate in the demonstration were unable, or unwilling, to commit the data processing resources required to implement the PAC system.¹⁶ DOH invited an additional 7 facilities from the Rochester and New York City areas to participate. In the end, DOH was able to secure formal agreements of participation from 17 facilities.

As Exhibit 3-1 shows, 9 hospitals and 8 diagnostic and treatment centers are currently implementing PACs on a demonstration basis. About half of the demonstration providers are in New York City (4 hospitals and 4 health centers). Most of the hospital-based demonstration providers have

¹⁶Included in the group of facilities that decided not to participate were the municipal hospitals affiliated with the Health and Hospital Corporation of New York City which historically have provided ambulatory services to about 40% of all Medicaid patients in New York City.

Exhibit 3-1

PAC Demonstration Facilities

	<u>Location</u>	Teaching <u>Status</u> (a)	Approximate <u>PAC Volume</u>
Hospitals			
Bronx Lebanon	New York City	T/R	150,000
Lutheran	New York City	T/R	72,000
Montefiore	New York City	T/R	96,000
Presbyterian	New York City	T/R	300,000
St. Clare's	Northeast	R	20,000
Highland	Rochester	T/R	35,000
Rochester General	Rochester	T/R	110,000
St. Mary's	Rochester	---	25,000
Strong Memorial	Rochester	T/R	86,000
D&Ts			
Albert Einstein COM	New York City	R	18,000
Montefiore CHCC	New York City	R	24,000
Montefiore FHC	New York City	R	20,000
Ryan Community	New York City	R	40,000
Benedict CHC	Northeast	---	8,000
Carver CHC	Northeast	---	18,000
Hudson Headwaters	Northeast	---	48,000
Mid-Hudson FHC	Northeast	R	12,000

(a) T = Teaching Affiliation
R = Residency Program

Source: DOH Fact Sheet., September., 1988

a teaching or residency program; and many of the health centers, particularly in New York City, have residents practicing on-site. Not surprising, the demonstration hospitals generally have a higher annual volume of visits that are eligible for PAC classification than the health centers.

3.2 Waiver Preparation

The state intended initially to include both Medicaid and Medicare under the PAC demonstration. Medicaid was scheduled to be the first payor active in the PAC demonstration because the reimbursement methodology and billing procedures are easily incorporated into the existing NYS MMIS. Existing Medicaid claims forms are used to bill Medicaid for visits under PACS. The only change required was to substitute a new master list of rate codes for each PAC with the old Medicaid visit rate code. All other changes in the billing system (e.g., rate calculation) should be transparent to the facility, including the MMIS interface. As part of its routine system update, the data processing vendor (Computer Sciences Corporation) for NYS simply updates the existing billing system with a new set of PAC rate tables for each demonstration facility.

In order to implement the demonstration and reimburse Medicaid visits under PAC rates, NYS DOH was required to secure a waiver from HCFA¹⁷. The waiver application was submitted in February 1987 and, based on the case-mix of the sample of visits in the 33 facilities, DOH projected a net savings of \$21.6 million for the Medicaid program for the three year demonstration period. HCFA approved Medicaid participation for three years in the PACs demonstration in August 1987. The waiver ended in August 1990, at which time, instead of renewing the waiver, a section was added to the Medicaid State Plan authorizing extension of the PACs demonstration for one more year, ending on July 31, 1991.

As mentioned above, the initial goal was to include Medicare participation by January 1988. However, DOH faced several obstacles in preparing the waiver cost estimates for Medicare, and at the same time, other activities consumed DOH staffs attention. Specifically, DOH's lack of data on Medicare volume and expenditures and differences between Medicaid and Medicare in terms of reimbursement methodologies (e.g., bundling the professional component into the PAC rate) and in billing approaches, (e.g., multiple Medicare intermediaries) created significant difficulties in estimating Medicare savings under PACs. In addition, during the second year of PACs implementation, DOH staff spent considerable time and effort designing and implementing a case-mix reimbursement system for ambulatory surgery for statewide implementation (Products of Ambulatory Surgery). As a result, HCFA and NYS DOH do not plan to include Medicare under PACs.

¹⁷A waiver of Medicaid statewideness (Section 1902 (a) (1) of the Act located at 42CFR 431.50 was required.

3.3 Development of the PAC Assignment Process

In order to implement the PAC system in the facilities, a grouping logic had to be developed to assign visits and the associated ancillary services into the correct PAC cell. As shown in Exhibit 3-2, the decision tree for PAC assignment is driven by a hierarchy of factors and was formalized into computer software for a PAC grouper. This exhibit lists the PACs in the order in which visits are assigned (Appendix D provides the PAC assignment algorithm specifications in more detail).

The assignment process begins with the classification of the patient's principal diagnosis into one of the 24 Diagnostic Service Categories (DSCs) representing similar problems with body systems/organs. The second step of the assignment process is to evaluate the ancillary tests provided to the patient. The grouper program analyzes all ancillary procedures, specifically targeting the key technologies that would assign a visit into a higher reimbursed PAC:

- * X-rays
- * chest X-rays
- * X-rays with contrast
- * mammograms
- * EEGs
- * CAT Scans
- * MRI's
- * cardiac stress testing
- * ultrasounds

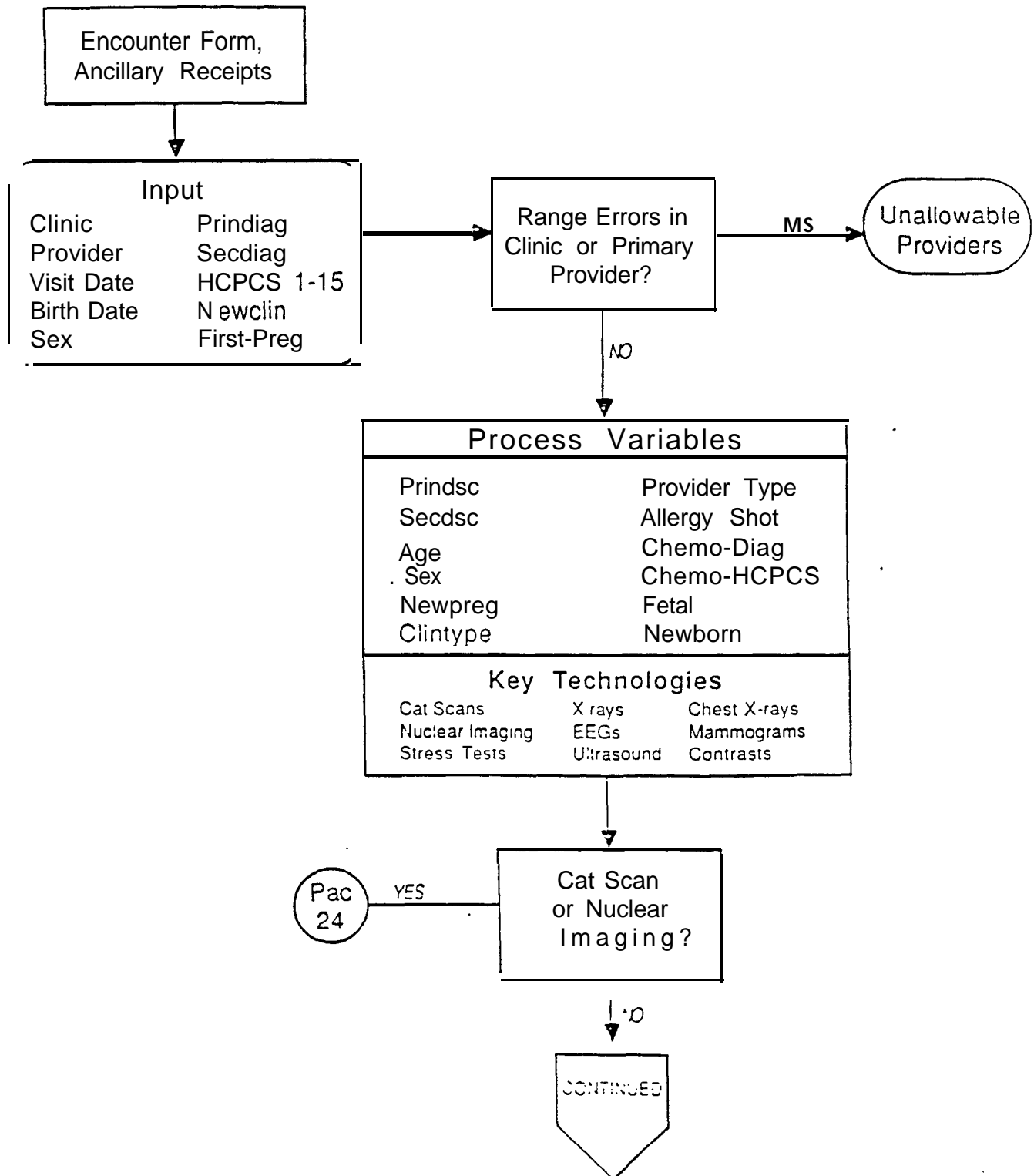
The third step in the assignment process reviews the clinic specialty code, the primary providertype code, and initial prenatal visit indicator. These codes are used to identify special ambulatory care services such as audiology, physical therapy and ophthalmology.

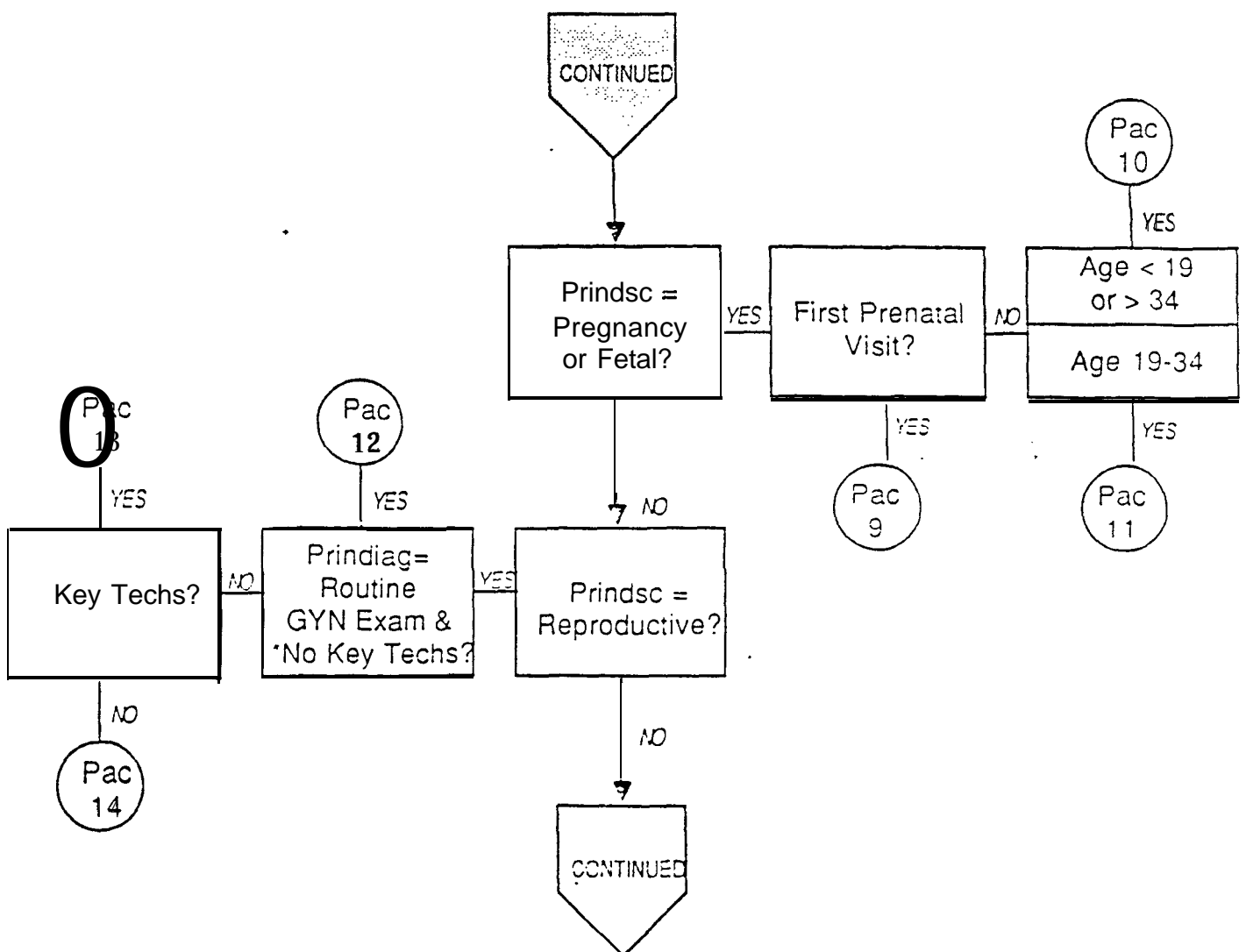
Exhibit 3-3 operationalizes the PAC assignment process by identifying the specific variables for each PAC which trigger assignment. The following observations can be made:

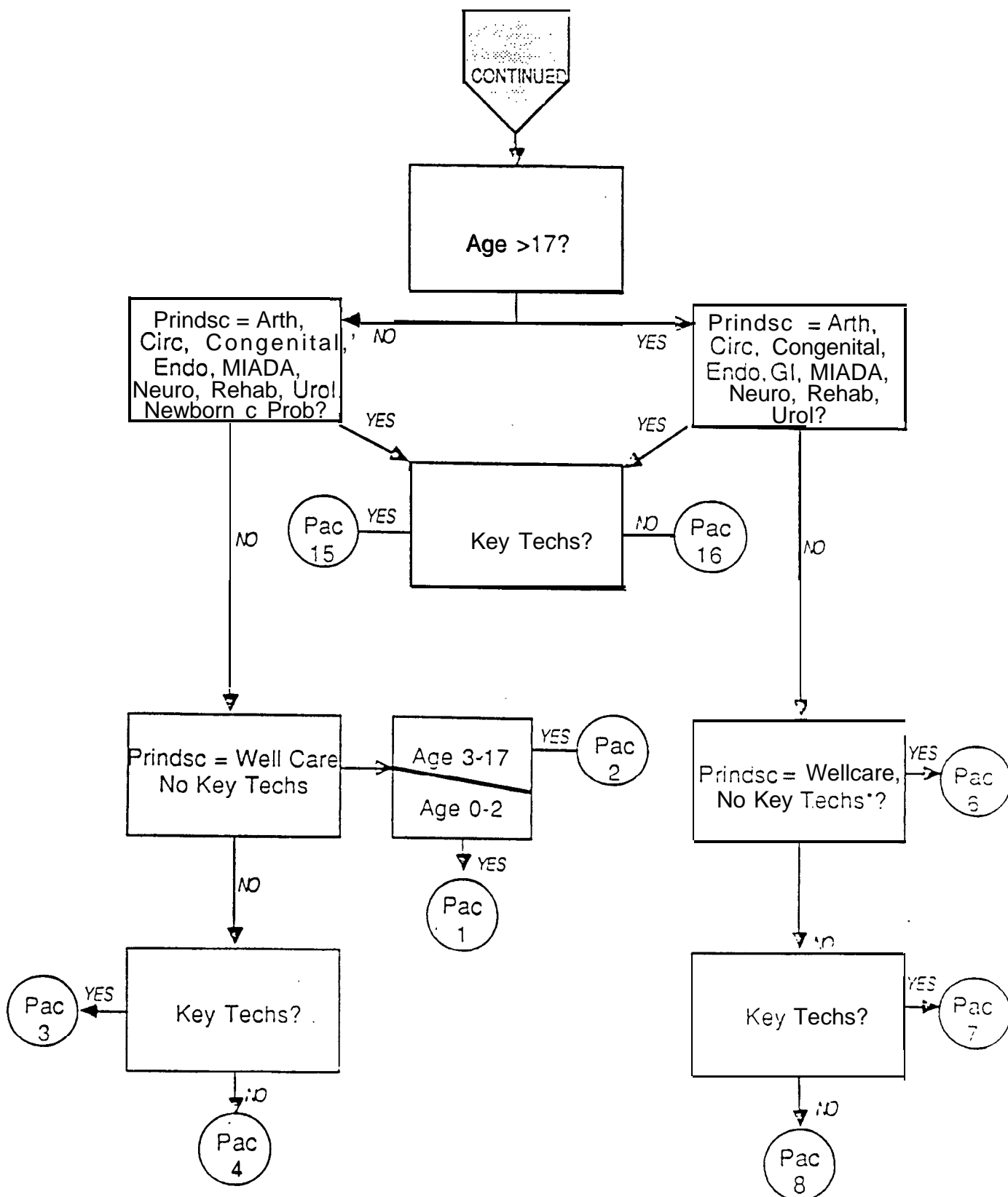
- * One variable triggers assignment for three pacs (PAC 24: provision of CAT scan or nuclear imaging; PAC 22: clinic setting; PAC 21: provider type). The combination of two or more variables trigger PAC assignment for the remaining twenty-two PACS.
- * Clinic setting triggers assignment for only two PACs (PACs 22 and 23), and requires the specification of five clinics (ophthalmology, physical therapy, rehabilitation therapy, speech therapy, and occupational therapy).
- * Provider type triggers assignment for only two PACs (PACs 21 and 23), and requires the specification of only four types of providers (audiologist, speech pathologist, occupational therapist, and physical therapist).
- * Primary diagnostic information is required for most (20 PACs) of the assignments; only three PACs (PACs 18, 19, 20) require information on a second diagnosis.

Exhibit 3-2

PACs Algorithm Decision Tree







* Except Chest X-Ray or Mammogram

Exhibit 3-3

Variables Triggering PAC Assignment

PAC	Description	Age	Sea	Clinic Setting	Provider Type	Principal Diagnosis (a)	Secondary Diagnosis (a)	1st Prenatal visit/Revisit	No Key Techs	Any Key Tech (b)	Specific Key Technologies			
											Cat-scan	Nuclear Imaging	Chest X-ray	Mammogram
24*	Diagnostic Investigation with Nuclear or Computerized Axial Tomography Imaging										x	x		
22	Ophthalmological Services			x (c)										
21	Audiologist Testing				x (d)									
23	Speech and Rehabilitation Therapy			x (e)	x (e)				x					
17*	Diagnostic Investigation of Class 4 Problem					x				x				
18	Management of Chemotherapy and Radiotherapy Services					x(f)	x(g)		x					
19	Management of Class 4 Problem					x(f)	x(g)		x					
5	Medication Administration					x(h)			x					
20	Management of Class 5 Problem					x	x		x					
9	Initial Prenatal Examination	<(i)	x			x		x (j)						
10	Prenatal Revisits and Post-Partum Visit, Age Over 34 or Under 19	x	x			x		x (k)						
11	Prenatal Revisits and Post-Partum Visit, 19-34	x	x			x		x (k)						
12	Annual Gynecological Examination					x(g)							x	x
13*	Diagnostic Investigation of Reproductive Problem					x				x				
14	Management of Reproductive Problem					x			x					

Exhibit 3-3

Variables Triggering PAC Assignment

PAC	Description	Age	Sex	Clinic Setting	Provider Type	Principal Diagnosis (a)	Secondary Diagnosis (a)	1st Prenatal visit/Revisit	No Key Techs	4ny Key Tech (b)	Specific Key Technologies			
											Cat-scan	Nuclear Imaging	Chest X-ray	Mammogram
15*	Diagnostic Investigation of Class 4 Problem	x				x		.		x				
16	Management of Class 3 Problem	x				x			x					
1	Well Care Examination, Child Age 0-2	x				x			x					
2	Annual Well Care Examination, Child Age 3-17 (l)	x				x			x					
6	Annual Well Care Examination, Adult Over Age 17 (l)	x				x							x	x
3'	Diagnostic Investigation of Class 4 Problem, Child Age 0-2	x				x				x				
4	Management of Class 3 Problem Child Age 0-17	x				x (m)			x					
7*	Diagnostic Investigation of Class 2 Problem, Adult Age Over 17	x				x (m)				x				
8	Management of Class 2 Problem Adult Over Age 17	x				x (m)			x					

NOTES:

* Diagnostic PACs

(a) DCS codes are required, unless otherwise specified

(b) Includes ultrasound, EEG, cardiac stress, chest x-ray, mammogram, contrasts

(c) Requires clinic setting = Ophthalmology

(d) Requires provider type = Audiologist

(e) Requires clinic setting = physical, rehabilitation, speech or occupational therapy AND provider type = speech pathologist, physical or rehabilitational therapist

(f) Requires DSC = 24 OR ICD9 codes for allergy diagnosis

(g) Requires ICD9 code .

(h) Requires DSC OR ICD9 code

(i) Patient must be over 7 years

(j) Requires initial visit

(k) Requires revisit

(l) May only be billed once per year

(m) Requires Principal Diagnosis not previously assigned

- * Where diagnostic information is required for PAC assignment, the coding convention required is generally based on DSC assignment. Only four PACs (PACs 18, 19, 5, 12) require specific ICD-9 CM classification codes (for either primary or secondary diagnosis).
- * Patient age is required for twelve PACs; Patient gender is required for only three PACs, all prenatal PACs (PACs 9, 10, 11).
- * Visit type (initial/revisit) is required for only three PACs, all relating to prenatal care (PACs 9, 10, 11).
- * The absence of a key technology is required for eleven PACs; The presence of a key technology is required for eight PACs; The presence or absence of a key technology is not considered in PAC assignment for five PACs.
- * Of the eight PACs requiring the presence of a key technology, three PACs require specific procedures, in HCPCS coding, to be provided (PAC 24: CAT scan and/or nuclear imaging; PACs 6 and 12: mammogram and/or chest X-ray). The remaining five PACs can be based on any of the remaining key technology procedures.

Thus, while a number of data elements are required for PAC assignment, only a few variables trigger assignment for any given PAC.

3.4 Installation of the PAC Grouper

The grouper had to be easily adaptable to both hospital and health center settings, and produce output in a standard format for a database that would be used to evaluate the classification scheme and recalibrate the pricing structure. Based on discussions with demonstration providers, it became clear that two grouper programs were required. One program was written in COBOL for application to mainframe computer systems, typically for use in hospitals; another program was written in BASIC for application on an IBM personal computer, often used by small health centers. Facilities using the COBOL grouper were required to develop all edit checks prior to submission of visit information to the grouper and to create the output for the evaluation database. The BASIC version, on the other hand, was designed to perform all edit checks and input validation, and to create the output for the evaluation database on a floppy disk.

Some facilities' data systems were not compatible with either COBOL or the BASIC PC groupers. In these instances, DOH provided a tape/disk or a hard copy of the PAC grouper for modification and incorporation into the facility's data system. Overall, most (12) facilities installed the PAC grouper on a mainframe or mini-computer, rather than on a personal computer (see Exhibit 3-4). Most of the hospitals processed the claims in-house, whereas most of the health centers contracted out the data processing activities.

Exhibit 34

Computer Process for PAC Grouper

<u>PAC Grouper Installation</u>	<u>Number of Facilities</u>
Mainframe/Mini-Computer	12
Hospitals	5
D&Ts	7
PC-based	5
Hospitals	4
D&Ts	1
<u>Data Processor</u>	
Vendor	8
Hospitals	3
D&Ts	5
Internal	9
Hospitals	6
D&Ts	3

Source: PAC Demonstration DP Fact Sheet, DOH, September 1, 1988

In addition to developing the PAC grouper and installation programs, DOH staff provided technical assistance to each demonstration facility. One DOH staff member was assigned to each facility to ensure a smooth implementation process. Project staff visited each facility to assist in the installation of the PAC grouper into their data processing system and consulted, as needed, with billing vendors. DOH staff prepared a general training manual and a PAC Evaluation System Data Abstract Dictionary which provides the official documentation to install and define the variables in the PAC system. DOH staff also assisted in efforts to incorporate PACs into the clinical setting such as providing training sessions with clinical staff and assisting in the redesign of encounter and/or lab requisition or ancillary order forms.

In order to ensure that the PAC grouper was functioning properly after installation, DOH supplied each facility with a test file of about 1100 observations (e.g., simulated visits). Upon installation of the PAC grouper, each facility ran the test file through the grouper and validated the resulting grouping assignments against tables of frequency distributions provided by DOH. When necessary, DOH project staff assisted demonstration data processing personnel in modifying the PAC grouper to run on each facility's computer system.

4.0 FACILITY IMPLEMENTATION

This section discusses the activities undertaken by the facilities to implement **PACs** and is based on observations from the eight facilities participating in our case study. Site visits were conducted to five hospitals and three diagnostic treatment centers, representing over half of the demonstration hospital-based programs and about one-third of the demonstration **D&T's**. As shown in Exhibit 4-1, the facilities involved in the case study effort also reflect the regional and data processing variation represented by all demonstration facilities. While the sample of demonstration facilities selected for site visits represents variation in facility type, PAC grouper installation, and region, the findings reported here only reflect the experience from these eight facilities, and therefore may not be generalizable to the other nine demonstration facilities, nor to the ambulatory industry as a whole if **PACs** were to be implemented statewide.

4.1 Incentives to Participate

As mentioned earlier, DOH encouraged facilities to participate, citing as one advantage, involvement in the development of a case-mix based prospective payment for ambulatory care. Indeed, one of the major considerations reported by facilities was the opportunity to build the internal systems and staff expertise required for such a system, particularly under the protection of the hold harmless conditions. The hold harmless provision minimized the risks, in terms of facility start-up and maintenance outlays, of participation.

Facilities also expressed other reasons for involvement. In particular, the **PACs** system was an important and innovative program to the DOH and participation would be viewed favorably by the state, as well as contribute to the facility's leadership role in the community. Furthermore, facilities were encouraged by potential for increased reimbursement under **PACs** (compared to the conventional rates), particularly for hospital-based ambulatory care programs (as mentioned earlier, existing state regulation capped payments at \$60, which is lower than many of the PAC rates).

Facilities were skeptical about their ability to maximize revenues under **PACs**. Unlike **DRGs**, the small number of classification groups did not create significant potential to "game" the system by "upcoding". Each PAC is sufficiently distinct that classification is generally unambiguous. Similarly, the small percentage (about 10%) of Medicaid patients that is represented in each facility did not warrant significant attention by the financial administration to identify ways to increase revenue under **PACs**.

Once the decision to participate was finalized, facilities generally required 3-4 months to implement **PACs**. The implementation process was typically overseen by a senior administrative staff person, usually from a hospital's financial unit, or in the case of the smaller diagnostic and treatment centers, from the billing department. Only one of the eight facilities, a large hospital, formed a "PACs

Exhibit 4-1

Sample of Facilities for Case Study

		Case Study Facilities (n=8)	Percent of All Demonstration Facilities (n=17)
Hospitals		5	56%
D &T's		3	38%
Region			
	Northeast	2	40%
	New York City	4	50%
	Rochester	2	50%
Data Processing			
	Internal	3	33%
	Vendor	5	63%
	PC-Based	2	40%
	Mini /Mainframe	6	50%

Committee” composed of representatives from each of the departments affected by the PACs system (e.g., data processing, clinic administrator, etc.).

4.2 General Implementation Requirements

While the actual process of implementation of PACs differed among facilities, there were three general requirements for PAC assignment, reimbursement, and evaluation:

- * Collecting specific data elements;
- * Establishing financial responsibility for ancillary services; and,
- * Bundling and matching all ancillary services with a given visit;

Before discussing each of the above requirements and the approaches undertaken by facilities to address them, it is helpful to view, in simplest terms, the steps to obtain reimbursement for a PAC visit (see Exhibit 4-2). Whether in hospital-based or in freestanding centers, all ambulatory patients are registered, and are asked to confirm patient residence, demographic characteristics, and insurance information. The clinic visit, or encounter, includes a physical exam provided by a variety of clinicians (e.g., nurse practitioner, physician assistant, physician, etc.); and in the larger hospitals, provided in a variety of clinic settings (e.g., OB/GYN, dermatology, ophthalmology). Ancillary services, either laboratory tests or procedures classified for PAC purposes as ‘key technologies’, can be either provided directly after the encounter that same day, or more commonly, at a later date.

In order to receive reimbursement under PACs, all ancillary services (non-key tech and key tech) must be matched with the visit in which the ancillary(ies) was ordered prior to submitting the visit to the PAC grouper for assignment. Upon PAC assignment, the appropriate facility-specific PAC rate code is applied and the facility submits the claim to the state.

4.3 Implementation Steps

While the previous scenario depicts a fairly straightforward process, a facility must conduct a thorough analysis of all information flows, manual and automated, beginning with patient registration procedures and ending with billing policies. As shown in Exhibit 4-3, each of these requirements had the potential to affect one or more operational areas within the facility, particularly patient registration and processing of encounter information, vendor relations, billing policies, and data processing. Changes required by the facility were dependent on the level of sophistication and flexibility of each facility’s

¹⁸The one exception is visits classified into PAC 5 which involves medication administration.

Exhibit 4-2

PRODUCTS OF AMBULATORY CARE (PACS)

OVERVIEW

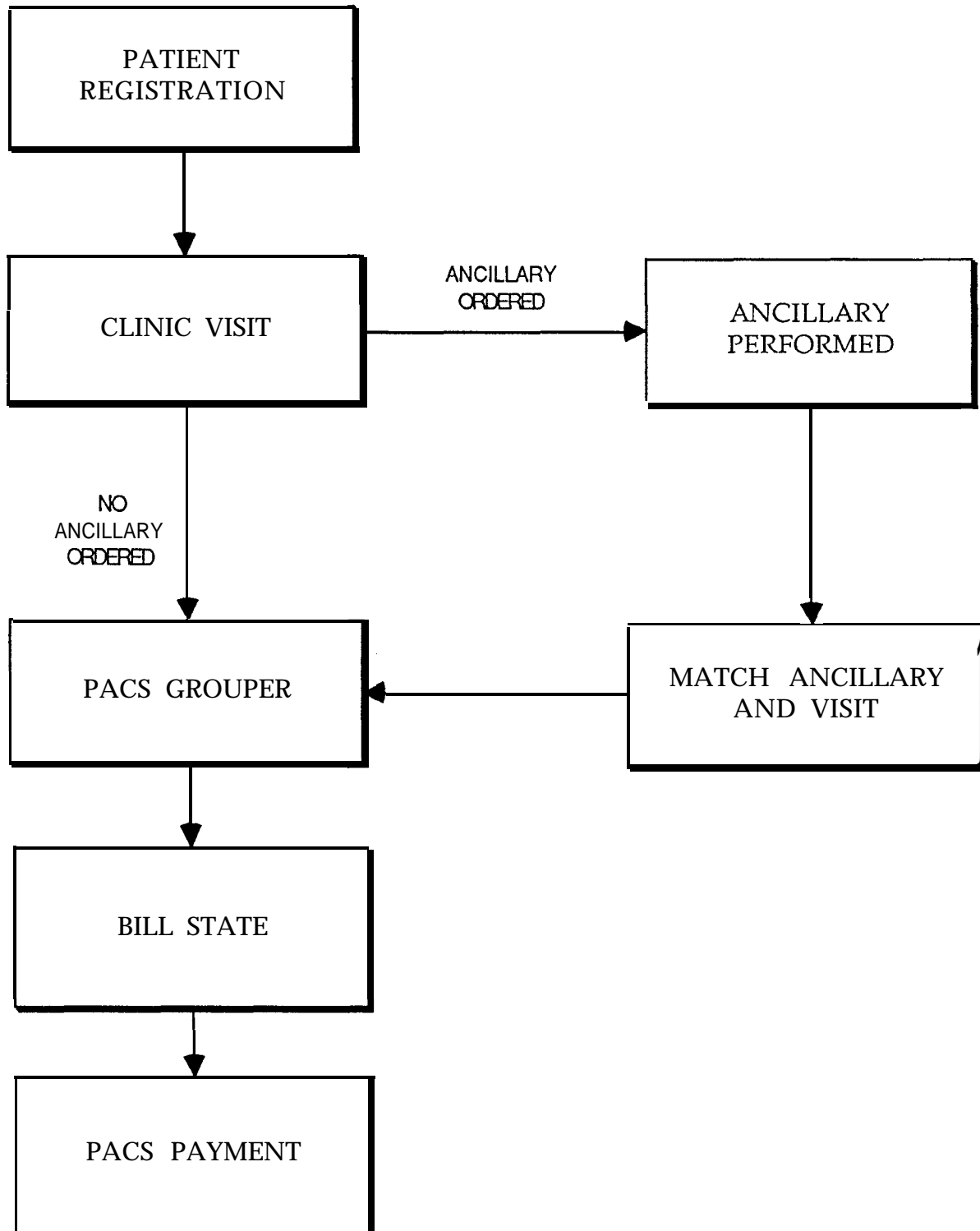


Exhibit 4-3

Implementation Requirements and Facility Operations Affected

<u>PAC Requirement</u>	<u>Facility Operation Affected</u>
1. Collect PAC Groupers and Evaluation Data	<ul style="list-style-type: none">• Patient Registration/Check Out• Encounter Forms• Data Processing
2. Be Financially Liable for All Ancillary and Key Tech Services	<ul style="list-style-type: none">• Vendor Relations• Data Processing• Billing Policies
3. Bundle All Ancillary Services Provided with the Visit	<ul style="list-style-type: none">• Ancillary Service Ordering Procedures• Data Processing• Billing Policies

existing data processing system, including the degree of integration of the patient registration system, ancillary ordering procedures, and billing policies into the management information system. As described below, the ability of the facility to link visits with ancillary services is also critical.

4.3.1 Data Collection

As a condition for participation in the PAC demonstration, facilities were required to collect the data needed for the PAC grouper software and to collect some additional data elements required for the PAC evaluation. As described in Section 3.3, the PAC grouper is dependent on nine data elements for PAC assignment. All diagnostic information is required in ICD-9 format which the PAC grouper then assigns to a DSC. All procedure codes are required to be in HCPCS (i.e., CPT-4) coding. DOH also required that facilities collect six additional variables for evaluation purposes. Exhibit 4-4 presents the total list of data elements that facilities were required to collect and report to DOH.

Several of the variables required for PAC assignment were often recorded in some manner on ambulatory clinic encounter forms prior to the demonstration. For example, patient demographic characteristics (age, sex) and diagnostic information (principal/secondary diagnosis) were often recorded on these forms, with the latter often in a pre-coded format. However, other information required for PAC assignment was not necessarily included on encounter forms or was on the form but not in the coding scheme required by DOH, particularly elements such as ancillary tests provided, provider type, and clinic type. Similarly, most of the data elements required for evaluation purposes were not typically captured on encounter forms.

As a result, one of the first tasks undertaken by demonstration facilities was an analysis of the information flow. Specifically, the following questions had to be addressed:

- * Which of the required data elements (regardless of whether for PAC assignment or for evaluation purposes) were already being collected by the facility?
- * Which new data elements would need to be collected, and what is the source, for these new data elements?
- * What crosswalks would be required to enable the facility to report existing data elements to DOH?

None of the facilities collected the data elements required for evaluation purposes. Although visit length was often on a facility's encounter form, it was typically recorded in a format for billing purposes (e.g., minimum/brief visit; limited services, intermediate service, extended service) and not in the time increments specified by DOH for evaluation purposes.

On the other hand, most facilities had already recorded, in some manner, the data elements required for PAC assignment. However, several items were in formats that were not directly

Exhibit 4-4

Variables Required for PAC Demonstration

Required for PAC Algorithm	
Primary Diagnosis (a)	Provider Type
Secondary Diagnosis (a)	Clinic Type
Age	Administration of Drugs
Sex	Ancillary Tests Provided (b)
1st Prenatal Visit	

Required for Evaluation	
1st Clinic Visit	Pie-admission Visit
1st Provider Visit	Post-surgical Visit
New Diagnosis	Length of Visit

(a) Diagnostic information is required to be in ICD9 CM coding

(b) Procedure codes are required to be in HCPCS (CPT-4) classification

transferrable. For example, several facility encounter forms included a space for the provider to report his/her ID number. Similarly, a few facilities provided space on the encounter form to indicate that ancillary services were ordered; however, most facilities did not collect the CPT-4 ancillary information on the encounter form. More commonly, a separate referral order form was completed, with a copy provided to the patient. However, neither approach actually confirmed that service was provided. Also, the larger hospital-based facilities used a different encounter form for each type of clinic, forcing a review of the encounter form to designate the type of clinic. As a result, facilities were required to develop crosswalks that transformed several variables into the DOH coding scheme.

Five of eight facilities (all three D&Ts and two of the five hospital-based programs involved in the case study) completely redesigned their encounter forms to accommodate the collection of the PAC assignment and evaluation data. To some extent, PAC implementation provided the impetus for many of these facilities to complete an already necessary revision of their encounter forms. In some cases, the encounter forms required updating to include common diagnoses and/or procedures; in other cases, the diagnoses and procedures had never been pre-coded (ICD-9 format for diagnoses and CPT-4 for procedures) to allow for a simple check off by the provider¹⁹. Redesigning the forms also allowed the facility to include the evaluation data elements (e.g., provider type, 1st prenatal visit, etc.)

The efforts undertaken by those facilities that redesigned their encounter forms should not be underestimated. For example, in one large hospital-based facility, 18 pre-coded encounter forms were developed for 56 separate clinics. Prior to PACs, each clinic used a separate encounter form with a list of common diagnoses and procedures; but the list was not pre-coded and had not been updated in years. Another facility adopted a general format for designing new clinic encounter forms, whereas, prior to PACs, each clinic had identified a variety of diagnoses and procedures, many of which were infrequently used. Clinical staff, particularly the medical director and clinic administrator, collaborated in redesigning the forms. A review of medical records was often conducted to update the diagnoses and procedure list. The entire process usually took at least a month, and in some cases three months, to complete.

Given the fact that most of the data elements required for PAC assignment were already captured on existing encounter forms, it is not clear whether the facilities would have gone through the tremendous effort to redesign their forms if the evaluation data elements were not a requirement of participation. In fact, although one of the hospital demonstration facilities redesigned its encounter forms, many of the evaluation variables (as well as whether the visit was the first prenatal visit) were asked as the patient was registered and input directly onto a computer screen, rather than recorded on the

¹⁹Some facilities revised their encounter forms with the more recent CPT-4 codes than those used by the state in the PAC grouper (CPT-4 codes are updated annually). This caused some initial problems for the facility in the PAC assignment process.

encounter form. An alternative that two of the hospital-based demonstration facilities used was to simply add an addendum to each encounter form to collect the data elements that were not already part of their encounter form.

In addition to modifying encounter forms, all the demonstration facilities enhanced their patient “check-out” procedures. While patient check-out procedures were common prior to PACs, there was much more emphasis on and training regarding the proper completion of the encounter form and ancillary service ordering. For example, as the patient finished each visit, a receptionist/clerk reviewed each encounter form for completeness and ensured that the patient had all the necessary ancillary service order forms, particularly for key technology services. One site developed an ancillary service log in which upon patient check-out, the clerk noted whether the patient was scheduled to receive any key technology services. This log was later compared, manually, against test results to identify whether there were any visits in which a key technology service was never performed.

4.3.2 Establishing Financial Responsibility for Ancillary Services

The PAC rates are all-inclusive; therefore another condition of participation was that the provider must be financially responsible for all non-key technology services (laboratory tests and simple EKGs) that are provided to Medicaid patients, regardless of whether the facility has the capability or equipment to provide the service. Unlike the provision of labs and simple EKGs, a facility had the option of specifying which of the nine key technology services it would agree to provide under the demonstration. However, all 17 demonstration facilities choose to be financially responsible for all key technology services.

As a result of agreeing to be financially liable for non-key and key technology services, a facility was required to address the following questions:

- * Which key tech, and non-key tech, services are performed by facility personnel and which are performed by an outside vendor?
- * Of those key tech and non-key tech services provided by an outside vendor, which are billed to the facility or billed to the patient’s insurer?
- * What financial arrangements have been made with outside vendors to insure they will bill the facility and not the insurer (e.g., Medicaid)?
- * What is the basis for the fees that the facility established for the key tech and non-key tech services that will be provided by outside vendors?

With one exception, all of the hospital-based demonstration sites performed laboratory and key technology services in-house. However, in some cases, the physician or physician group responsible for interpreting the test results, particularly for key technology services (e.g., radiology), were not salaried

hospital staff. As a result, the hospital and physician(s) made arrangements for the professional fees to be billed directly to the hospital, instead of Medicaid. These 'arrangements' were informal in nature, and did not involve any formal contract or negotiation. The physician(s) actually preferred to bill the hospital directly, avoiding the paperwork involved in billing the state. The reimbursement rates were generally similar to the rates paid by Medicaid.

All of the diagnostic and treatment centers, on the other hand, contracted out for laboratory, as well as several key technology, services. For the most part, demonstration facilities made arrangements with existing vendors for laboratory services. However, while not a direct impact of PACs, negotiating a contract for laboratory services under PACs provided one facility with the opportunity to reexamine its rates and quality of service, resulting in a change of vendors for laboratory services.

Few of the D&Ts provided key technology services in-house. Formal agreements with existing vendors were 'negotiated' to provide these services. The payment was generally based on a global fee (technical and professional) and was similar to the payment level previously reimbursed under Medicaid. None of the case study facilities expanded the type of services they offered, although one facility (not involved in the case study effort) reported the purchase of ultrasound equipment on the hold harmless reports.

Outside vendors (including the physicians who interpreted results) providing laboratory and key technology services were responsible for reviewing each test/procedure order to determine whether the test or procedure should be billed to Medicaid or directly billed to the demonstration facility. Identifying the primary insurer as Medicaid did not necessarily guarantee that the visit was a PAC-reimbursable visit (e.g., perhaps the lab test or the radiology procedure was for an ambulatory surgery or emergency room visit). As a result, demonstration facilities established procedures for identifying whether the test is related to a PAC-reimbursed visit. Typically, demonstration facilities used an additional code under primary insurer to indicate that the service order was for a PACs-related visit. One facility developed a coding system with different color stickers to indicate whether the laboratory or ancillary test should be billed to the facility. However, facilities were unable to report what measures were used to ensure that the vendors, including physician(s) responsible for interpreting the test results, were not billing Medicaid.²⁰

Arrangements between demonstration providers for provision of key technology services also had the potential for duplicate billing. For example, one demonstration diagnostic and treatment center contracted with a nearby demonstration hospital to provide several key technology services to the D&T's

²⁰However, NYS DOH intends to conduct an audit to assure that vendors are not inappropriately billing the Medicaid program.

PAC patients. As a result, the demonstration hospital was responsible for providing key technology services to both its own PAC patients and another demonstration facility's PAC patients. The hospital also had to ensure that the claims for the D&T's PAC patients were billed to the D&T, and not billed to the state. On the other hand, the hospital's PAC claims could be billed directly to the state. Again, it was not clear what measures were used to verify and enforce appropriate billing practices.

4.3.3 Bundling/Matching all Ancillary Services with a Visit

As mentioned above, laboratory services and most **office-based** procedures do not affect PAC assignment and reimbursement. However, the provision (and absence) of the nine key technology services directly influences PAC assignment and reimbursement. PAC assignment may be delayed and complicated by practice patterns in ambulatory care. The provision of those services considered to be key technology services under PACs can be provided days, if not weeks, after the originating visit. It is not uncommon for a facility to have a high rate of "no-shows", that is, patients failing to show-up for the ordered key technology service. As a result, a condition of demonstration participation stipulates that a facility must confirm the provision of key technologies prior to processing a visit through the PAC grouper software. A facility must also be able to bundle, or match, all ancillary services with a given visit.

In order to bundle ancillary services with visits, a facility must address the following questions:

- * Are procedure codes entered prior to, or after, the test is performed?
- * What method will be used to ensure that a key tech has been provided prior to entering a visit through the PAC grouper?
- * How will visits with key techs be identified, and then separated, from the billing stream to await confirmation prior to processing the grouper software?
- * Once a key tech has been confirmed, how will the procedure code be merged with the remaining information for the visit?

The method employed to confirm the provision of ancillary services (key tech and non-key tech service), and the ease with which a facility could bundle all related ancillary services, was highly dependent on the type of ID, or account number, assigned to individual patients. Generally, facilities employed one of three types of patient IDs:

- * Patient-based: a unique ID per patient, regardless of visit date or whether ancillaries were provided.
- * Visit-based: a single ID for each visit and includes related ancillaries provided either during the visit, or at a later date.

- * Service-based: a single ID for each visit and includes any ancillaries provided during the visit; a separate ID is assigned for ancillary services provided at a later date.

Thus, only one ID is assigned per patient under the patient-based systems; whereas, multiple IDs can be assigned per patient under either the visit-based or service-based systems. The importance of the ID assignment to ancillary service matching can be seen in Exhibit 4-5.

The simplest, and most frequently used identification system, was the visit-based approach in which a separate ID was assigned for each visit and included any ancillary services (key tech and non-key tech) associated with the visit, regardless of whether the ancillary service was provided on the same day as the visit. For example, a visit on day 1 in which a radiology procedure was ordered and subsequently performed on day 3, would be assigned one ID number. If the patient came in for another visit on day 11, followed by another ordered procedure on day 13, a different ID would be assigned, resulting in two separate IDs. Matching ancillaries to visits under this ID system was not required, since by definition, all ancillary services already had the same ID number assigned to it as the originating visit. Half of the facilities involved in the case study used this approach, thus avoiding a burdensome and time consuming matching process.

The most problematic approach was where a patient was assigned a unique ID number, regardless of the date of service or whether ancillaries were performed, as in the patient-based identification system. Thus, for the example described above, the patient would be assigned only one account number for both visits on days 1 and 11 and for both procedures performed on days 3 and 13, resulting in only one ID. The facility has no way to match ancillaries with a given visit without linking key data elements together. For patient-based accounts, facilities were required to link three variables: two dates of service (date of the visit and date the ancillary was performed) and the originating clinic type (e.g., general medicine, pediatrics, etc.). Two of the eight case study facilities, both large teaching hospitals in New York City, used this approach to reconcile ancillaries with visits. Since the three variables are all on the claim, the match was completely done by computer. However, considerable time and effort from data processing personnel was expended to write the required software.

One facility used another approach which required an additional data element to link visits with ancillary services. Under the service-based account system, a different ID was assigned for each date of service, regardless of whether the date of service was simply a visit (with no ancillaries provided), or whether a patient only came into the facility for an ancillary procedure. Under this system, the patient would be assigned four separate IDs for each date of service (day 1, 3, 11, 13). The only way to match ancillaries with visits was to include the patient's name, along with the date of service and clinic type, into the linking process. Given the inherent difficulties in matching names by computer, this one facility conducted this matching process with substantial manual intervention.

Exhibit 4-5

Patient Identification and Bundling Ancillary Services

Patient ID

Data Elements Required to Match Ancillary Services with Visit

Patient-based:

Unique ID per patient, regardless of visit date or whether ancillaries were provided.

- Date of visit
- Clinic type which ordered the ancillary service
- Date ancillary service provided

Visit-based:

Single ID for each visit; including related ancillary services provided during the visit or on a later date.

- No matching required since ancillaries have same ID as visit

Service-based:

Single ID for each visit, including ancillaries provided during visit. A separate ID is assigned for ancillary services provided at a later date.

- Patient name
- Clinic type which ordered the ancillary service
- Date ancillary services provided

Although facilities identified the procedures required to match ancillary services with the visit, bundling the services did not necessarily mean that the service was actually performed. Facilities based the confirmation of the ancillary service on receipt of lab/procedure results, not on receipt of billing. However, given the timeliness of (or lack of) receiving results, combined with frequent delays in scheduling certain ancillary services (e.g., three weeks after the visit), all but one of the facilities held accounts open until receipt of the results. Specifically, visits for which a key technology or other ancillary was ordered were held open (suspended from billing) for a set period of time to await reporting of the test result. Once reported, the service was matched (if necessary) with the visit and the account closed for billing. At the end of the suspense period, the account was closed for billing regardless of whether or not the test result was received. Visits without ordered ancillary services were released for billing within the usual billing cycle.

The length of the suspense period was up to the facility, and was dependent on the efficiency of its physicians/vendors in submitting test and procedure results. The suspense period generally ranged from 2 weeks to 90 days in the case study facilities. One facility held accounts with ancillary services open for as long as nine months. Given that suspended claims also affect cash flow, several facilities concentrated their efforts primarily on visits with key technology services, which assign the visit into a higher reimbursed PAC. Facilities had no financial incentive to bundle laboratory or other non-key tech services with visits since the level of reimbursement is differentiated by provision of key technology services. However, once a facility identified the procedures for bundling ancillary services with visits, there appeared to be no reason for not matching all ancillary (key tech and non-key tech) services.

One facility did not hold accounts open to confirm the provision of ancillary services. Instead, all visits were billed directly to the state during its normal bi-weekly billing cycle, allowing the facility to receive partial payment. However, every quarter, a “sweep” of all Medicaid claims was performed to match all ancillary services with the appropriate visit. These visits subsequently got re-PACed and the facility submitted adjustment claims to the state. This one facility estimated that about 5-10 percent of the visits have to be resubmitted to the state for adjustment.

Most facilities added, or reassigned, staff to accomplish the tasks required to implement PACs. Several facilities added data entry clerks who also assisted in matching visits and ancillary services. Only one facility incorporated the Medical Records Department into the process by establishing an entirely new unit within Medical Records to perform data entry tasks and match visits and ancillaries.

4.4 Hold Harmless Provision

The hold harmless provision ensures that demonstration facilities will not incur a loss in their average Medicaid reimbursement as a result of participation. The determination is made by comparing

the Medicaid rate that would have been applied in the absence of PACS with the average rate of reimbursement that was received under the PAC methodology. This comparison is only made for visits where Medicaid is the sole insurer (and therefore the effects of any cost shifting incurred due to PACS are ignored). Facilities were required to report the additional expenses of PAC participation including: start-up costs which were allowed on a one-time basis, and on-going costs that occurred over the course the demonstration. Specifically, DOH allowed the following start-up and ongoing costs:

- * Commuter Hardware: the purchase of computer hardware was allowed on a one-time basis and included microcomputers devoted to processing PAC software and any expenses incurred by contracting with outside vendors for the development of PAC software.
- * Commuter Software: the costs of converting the PAC software and interfacing the grouper software with existing databases were allowed.
- * Labor Costs: the hiring of **new** staff, particularly clerical (e.g., billing, data entry, medical records), were allowed labor expenses. Additional type of staff, either in specific clinics or other administrative areas required justification. The percentage of time devoted to PACs by existing staff were not allowed costs.
- * Purchased Ancillary Services:²¹ expenditures incurred by facilities purchasing new ancillary services from outside vendors for Medicaid clients were allowed. Ancillary services that the facility purchased prior to PAC implementation were not considered to be allowed costs (because they were already included in the facility base year reports).
- * Provision of New Ancillary Services:²² expenses related to providing **new** ancillary services to Medicaid patients were allowed costs, including the depreciation costs for the purchase of new ancillary equipment, new staff to operate the equipment, and the required supplies. These allowed costs were only for facilities which expanded the type of ancillary services provided on-site.

DOH has received worksheets and reviewed the additional expenses related to the hold harmless provision. Through May of 1990, only 5 of the 17 demonstration facilities submitted hold harmless reports to DOH, and all five are from diagnostic and treatment centers (see Exhibit 4-6). As shown, reported costs for implementing PACs ranges from about \$44.5 (AECOM) to \$351 (Ryan) thousand dollars. Four of the five D&Ts reported over a third or more of the additional expenses to be in labor, particularly for billing clerks and data entry personnel. Two (AECOM and Mid-Hudson) of the facilities reported about forty percent of the additional expenses to be for computer hardware and software. Another two facilities (Ryan and Carver) reported over half of the additional expenses for purchased

²¹The ancillary services included both key technology services, as well as any costs for routine laboratory tests and EKGs.

²²Ibid.

Exhibit 4-6

Reported Expenses for PACs Implementation (a)

Line Item	Albert Einstein College of Medicine		Ryan Community Health Center		Mid-Hudson Family Health Center		Hudson Headwaters Health Center		Carver Community Health Center	
	Allowed cost	Percent of Total Allowed Cost	Allowed cost	Percent of Total Allowed cost	Allowed cost	Percent of Total Allowed cost	Allowed cost	Percent of Total Allowed cost	Allowed cost	Percent of Total Allowed cost
Facility Type	D&T		D&T		D&T		D&T		D&T	
Computer	\$19,587	44%	\$30,998	9%	\$63,004	43%	\$12,247	21%	\$12,867	11%
Hardware	\$18,137	41%	\$998	----	\$27,320	19%	\$2,727	5%	\$3,970	3%
Software	\$1,450	3%	\$30,000	9%	\$35,684	24%	\$9,520	16%	\$8,897	8%
Labor	\$20,969	47%	\$114,171	33%	\$57,803	39%	\$42,243	71%	\$29,987	25%
Purchased Services (b)	\$3,982	9%	\$205,756	59%	\$19,038	13%	\$2,292	4%	\$71,002	60%
Provided Services (c)	\$0	----	\$0	----	\$6,978	5%	\$2,401	4%	\$4,765	4%
TOTAL	\$44,538	100%	\$350,925	100%	\$146,823	100%	\$59,183	100%	\$118,621	100%

(a) Through May 1990

(b) Purchased services refer to new services provided by outside vendors

(c) Provided services refer to new services in-house, including depreciation costs for the purchase of new ancillary equipment, new staff and supplies for equipment

Source: Calculated from Hold Harmless Reports submitted to DOH.

services by outside vendors, particularly for laboratory and key technology services. Using these reported additional costs for implementing PACs, DOH determined whether the facility incurred a loss in their average revenue under the PAC methodology compared to what they would have received under the conventional methodology. Based on the volume of Medicaid visits under PACs relative to the facility's total Medicaid volume, DOH adjusted the PAC rates for those facilities that incurred a loss, as determined by DOH. DOH has adjusted PAC rates through March 1989 and reports an average rate of \$78 compared to an average conventional rate of \$69.²³

4.5 Perceived Impacts on Quality of Care

The actual impact of the PAC system on the quality of care delivered to patients by demonstration providers is beyond the scope of this report. However, the perceived absence of any impact on patients or effect on providers in the clinic setting was striking. In interviews with clinical staff, only a few clinicians were aware of the definition of the term 'PACs', much less any of the related terminology (e.g., 'key technology'). The clinicians' only acknowledgement of recent changes related to the new data elements they were required to complete on the encounter form, most of which are for evaluation purposes, not for PAC assignment. Most did not feel that the new requirements for completing the encounter form were burdensome or time consuming.

While not a scientific endeavor, interviews with physicians and nurses did not suggest any changes that were associated with PAC implementation in visit patterns or duration, ancillary ordering utilization, or case-mix among patients. Nor did the clinical staff identify any impacts on patients. Based on these interviews, DOH did indeed meet its objectives in designing a reimbursement system that is transparent, or invisible, to the provider and patients. However, these questions will be examined more rigorously using encounter data from all demonstration facilities, with the results reported in a separate document."

²³New York State Ambulatory Care Demonstration Authority Initiatives, New York State Department of Health Office of Health Systems Management, Report to the Legislature, March 31, 1990.

²⁴As mentioned previously, subsequent reports will address the impacts of the PACs system on utilization.

5.0 THE FUTURE OF THE PAC SYSTEM

During the last year, DOH has been reviewing the PAC reimbursement methodology and assignment process to ensure that payment levels reflect current prices and that the PACs classification matrix reflects true differences among patients. The implementation experience of the demonstration facilities also contributed to several modifications to the PAC system. This section describes proposed changes to the PAC reimbursement systems as well as efforts to implement PACs on a broader basis. When finalized, most of these new initiatives will become effective in early 1991.

5.1 PAC Recalibration

Case-mix payment systems must be rebased or recalibrated from time to time, to capture changes in relative resource requirements and in technological bases for grouping patients. Recalibration activities focussed on updating the prices used in calculating the facility-specific price and the case-mix related direct price, including refining the adjustment factor for indirect contact in the case-mix direct component. Planned changes to the facility component generally include updating the prices used in the calculations, rather than setting costs prospectively. All costs for operations, pharmacy, teaching and capital will be updated from reported 1984 prices to reported 1987 prices (see Exhibit 5-1). As shown (in Exhibit 5-2), the average facility component will be about \$53 for hospitals and \$48 for health centers. However, basing the facility component on 1987 reported costs results in a higher rate (averaging about \$8.50 more) for hospital-based programs, and in a lower rate (averaging about \$2.00 less) for health centers, than if the facility component were trended forward using 1984 reported costs.

Also shown in Exhibit 5-1 are the proposed changes to the case-mix related direct price. These changes reflect updated prices and revised amounts of time per visit. Additional sources of wage data were applied and the methodology for calculating the adjustment to the direct contact price was refined. The time spent per provider per visit for primary providers, based originally on 1985 survey data, will be updated using the 1990 evaluation data. While the time spent by support staff and the patient-related non-contact time will not be updated (and will still be based on 1985 survey data), several new sources of wage data will be applied to derive wages for both labor components (primary provider and support staff) and for the patient non-contact time price. In particular, salary schedules from the Association of American Medical Colleges and the New York States Supplement to the Institutional Cost Reports will be added (and in some cases replace salary information obtained from nurses contracts or from the New York State Civil Service). The Nursing Home Wage Equalization Factor Classification System will also be used for regional adjustments.

Exhibit 5-1
PAC Recalibration Methodology

Component	1985 Base Year	1991 Proposed
<u>Facility</u>		
Operations	Lower of reported costs, 1984 or statewide ceiling 60%	Lower of reported costs, 1987, or statewide average
Pharmacy	Reported costs, 1984	Reported costs, 1987
Teaching	Lower of reported costs, 1984 or statewide ceiling	Lower of reported costs, 1987, or statewide average
Capital	Reported costs, 1984	Reported costs, 1987
<u>Price</u>		
Labor		
Time	1985 Survey	1990 Evaluation Data
Wages	COTH, NYCS, Rn Contracts	COTH, ICR Supplement, NH WEF
Support Staff Price		
Time	1985 Survey	1985 Survey
Wages	COTH, NYCS, Rn Contracts	COTH, ICR Supplement, NH WEF
Patient Related Non-Contact Price		
Time	1985 Survey	1985 Survey
Wages	COTH, NYCS, Rn Contracts	COTH, ICR Supplement, NH WEF
Adjustment Factor	1.5 for "downtime" leave, & supplies in non-key tech PACs	1.49 for leave, supplies, and increase in average time per visit
Ancillaries		
Utilization	1985 Survey	1990 Evaluation Data
Fee Schedule	BC/BS Matrix I Fee Schedule	BC/BS Empire Medicare Fee Schedule

NOTES:

COTH = College of Teaching Hospitals
NYCS = New York Civil Service
ICR = Institutional Cost Report

NH WEF = Nursing Home Wage Equalization Factor
Classification System
BC/BS = Blue Cross/ Blue Shield

Exhibit 5-2

PAC Recalibration Figures

	1985 Base Year <u>Trend Per Visit, 1990 \$</u>	1990 Proposed <u>Trend Per Visit, 1990 \$</u>
<u>HOSPITALS</u>		
Facility Component		
Operations	\$27.74	\$30.99
Pharmacy	\$6.27	\$7.45
Teaching	\$5.70	\$9.21
Capital	\$4.98	\$5.51
T o t a l	<u>\$44.69</u>	<u>\$53.16</u>
Price Component		
Labor	\$20.19	\$25.07
Ancillaries	<u>\$23.56 (a)</u>	<u>\$16.80 (b)</u>
T o t a l	<u>\$43.75</u>	<u>\$41.87</u>
Total	\$88.44	\$95.03
<u>D&Ts</u>		
Facility Component		
Operations	\$42.26	\$41.90
Pharmacy	\$2.66	\$1.43
Teaching	\$0.00	\$0.00
Capital	\$4.62	\$4.25
Total	<u>\$49.54</u>	<u>\$47.58</u>
Price Component		
Labor	\$20.19	\$25.07
Ancillaries	<u>\$23.56 (a)</u>	<u>\$16.80 (b)</u>
Total	<u>\$43.75</u>	<u>\$41.87</u>
Total	\$93.29	\$89.45

(a) Includes a \$1.00 add-on for supplies, as estimated by DOH, November 15, 1990

(b) Includes a \$2.00 add-on for supplies

Source: New York State Department of Health, November, 1990

The ancillary component will also be refined. Ancillary utilization, based on 1985 survey data, will be updated using the 1990 evaluation data. In addition, the prices that had formerly been based on a Blue Cross/Blue Shield commercial fee schedule for upstate New York will now be based on the Medicare fee schedule from Empire Blue Cross/Blue Shield in New York City. DOH considered the Empire fee schedule to be more comprehensive and the Medicare prices to be more reflective of Medicaid prices.

Finally, DOH refined the method of calculating the indirect time adjustment that is applied to the direct contact price. The original factor (also shown in Exhibit 5-1) increased the direct labor price by 50 percent, based on estimates in the literature. However, the DOH recalculated the adjustment factor, basing it on the amount of non-work time, supplies, and some of the increase in the average time per visit by providers (based on 1990 evaluation data). Specifically, the adjustment factor is the sum of three components:

- * 18 percent reflects the annual work schedule that represents leave (vacation, sick time, holiday, and professional leave);
- * 9 percent reflects the percentage add-on for supplies;
- * 22 percent reflects half of the increase in the average time per visit by providers (based on 1990 evaluation data).

Based on the above estimates, the total adjustment factor represents a 49 percent increase to the direct contact price, compared to a 50 percent increase that was applied initially.

5.2 Refining the PAC Assignment Process

Several changes to the PAC algorithm have also been proposed, some of which were designed specifically to simplify PAC implementation at the facility-level. Other changes reflect concerns about the validity of the PAC classification system. For example, a separate postpartum care category was established in order to distinguish postpartum visits from other reproductive-related visits. In order to create a new PAC designation, the PAC grouper logic required several changes. Postpartum care diagnoses are currently assigned to the Reproduction DSC, with assignment to either PACs 13 (Reproductive Diagnostic Exam) or 14 (Reproductive Management). To segregate these visits, a new postpartum DSC was created (DSC 26 = Postpartum Care), based on a set of ICD-9 diagnostic codes

indicating postpartum visits.²⁵ The PAC algorithm also required a change. Visits that are assigned to DSC 26 will now be assigned to new PAC product group: PAC 25 Postpartum Care. The assignment to PAC 25 is made after assignment to the prenatal PACs (PACs 9,10,11) in the assignment algorithm. Thus, visits are assigned to PAC 25 if the principal diagnosis is assigned to DSC 26.

DOH staff also analyzed the contribution of age in distinguishing PACs 10 and 11 (Pregnancy Revisits 18 years and under, and Pregnancy Revisits 19-34 years, respectively). DOH reports that the analysis suggests that age is not a significant factor, but that the level of complexity of a pregnancy revisit is more important. Therefore, it has been proposed that the prenatal revisits in PACs 10 and 11 no longer be based on age. Rather, ICD-9 diagnosis codes indicating visits for complicated pregnancies should be assigned to PAC 10; and codes indicating normal pregnancies should be assigned to PAC 11.

Several other changes have been proposed to simplify implementation at the facility level particularly related to data elements that are not normally collected. For example, the ophthalmology clinic setting will no longer be used to assign visits to PAC 22 (ophthalmology services). Instead, PAC 22 will rely on a principal diagnosis falling into DSC 2 (problems, injuries and diseases of the eye). Similarly, clinic setting and provider type will no longer be used to assign visits to PACs 21 (hearing) and 23 (speech and rehabilitation). The basis of assignment will be based on principal diagnoses and any related procedures (according to ICD-9 coding). In addition, all visits with diagnoses or procedures related to speech problems will be separated from rehabilitation visits in PAC 23 and combined with visits related to hearing problems in PAC 21. One of the primary reasons DOH eliminated the use of clinic setting and provider type is to maintain comparability among facilities in terms of relying on ICD-9 coding, rather than the specific clinic names or provider types as defined by each facility.

5.3 Statewide Implementation of PACs

Rather than extending the Medicaid waiver (which ends July 31, 1991), New York State plans on implementing PACs statewide for a select group of primary care providers on July 1, 1991. Using PACs as a vehicle for reimbursement, New York State took the opportunity presented by recent legislation to promote primary health care services. Legislation passed in the 1990 session authorized several primary care initiatives to enhance and improve primary care services, two of which will base

²⁵ This change essentially moves the postpartum diagnoses from DSC 17 to DSC 26, which is the new DSC number assigned to the new postpartum DSC.

reimbursement on PACs.²⁶ The Preferred Primary Care Provider (PCP) and the Preferred Physicians And Children (PPAC) programs have several goals:

- * to improve access for Medicaid eligible persons to comprehensive primary care and related services;
- * to promote delivery of recognized standards of primary care for Medicaid eligible patients of all ages, particularly children;
- * to reduce episodic, non-emergency, use of hospital emergency departments;
- * to control system-wide Medicaid costs through promotion of appropriate use of primary care services and development of models of service delivery that are cost-effective;
- * to encourage development of primary care services in areas of high need and reduce related morbidity and mortality in underserved areas;
- * to stress illness prevention and early detection and intervention.

Two major incentives exist that will encourage participation under these initiatives: the potential for an increase in Medicaid reimbursement and in volume.

5.3.1 Preferred Primary Care Provider (PCP)

The first initiative targets institutional-based providers. Under PCP, funding will be available for selected hospitals and diagnostic and treatment centers to develop and expand primary care services in underserved areas. Enhanced Medicaid reimbursement, based on PAC rates, will be offered to all diagnostic and treatment centers and to a limited number of hospital-based outpatient departments designated as Preferred Primary Care Providers. However, an add-on to the rate will be considered for hospital expenses related to recruitment, retention of and site development for primary care practitioners. The total level of funds available for these enhanced rates varies by type of provider. During the 1990-91 state fiscal year, approximately \$13 million in additional Medicaid reimbursement will be available for designated diagnostic and treatment centers. Two million dollars will be available in calendar year 1991 for designated hospitals.²⁷

²⁶Section 2807(12) of the Public Health Law authorizes a new provider category.

²⁷Request for Applications, "Primary Care Development Program of the New York State Primary Care Initiative," New York State Department of Health, Office of Health Systems Management, November 1, 1990.

One significant difference under PCP will simplify provider participation. Preferred providers will not be responsible for installing the PAC grouper, as under the PACs demonstration. Instead, the PAC grouper will be installed centrally, at the Medicaid fiscal intermediary (Computer Sciences Corporation). Providers will bill Medicaid using a generic rate code indicating that the claim should be processed through the grouper. Using data that are currently reported on the Medicaid claim form, the grouper will assign the visit to one of the 25 PAC groups using principal diagnosis, patient age and procedure. While providers under PCP will not be required to collect additional data elements, NYS DOH may request providers to submit some evaluation data. In addition, PCP providers will be responsible for providing or arranging for a minimum of preventive health services, and must be organized and equipped to manage several medical conditions in the ambulatory setting which are associated with excess inpatient hospital admissions.²⁸

Like the PAC demonstration, hospitals and D&T's selected as preferred providers will be assured, under a hold harmless provision, that they will receive no less under PAC reimbursement than the conventional Medicaid payment system for 1991. In addition, DOH anticipates transitioning all PACs demonstration providers onto the PCP program in July 1991, when the authorization for extending the PACs demonstration expires under the Medicaid State Plan.

5.3.2 Preferred Physician And Children Program (PPAC)

The second primary care initiative targets individual physicians in private practice, offering increased Medicaid fees to designated primary care physicians who provide services to children. While the PACs demonstration did not include visits to private physicians offices, PACs will be used to reimburse 'preferred' primary care physicians and specialists who provide services to children under 21 years of age. The fees will be higher than the normal Medicaid rates (approximately at levels comparable to commercial insurers). Visits will be assigned to only 15 of the 25 PAC groups and will be based on the same algorithm as PACs.²⁹ However, physicians will not be required to be financially responsible

²⁸The preventive services include hypertension and diabetes control; immunization; health lifestyles promotion; cervical, breast, and colon cancer screening; HIV screening and counseling; family planning; and sexually transmissible disease services. The medical conditions include adult and pediatric otitis media; respiratory infection; chronic obstructive pulmonary disease; adult and pediatric pneumonia; adult and pediatric bronchitis/asthma; heart conditions including angina and chest pain; and cellulitis and differential diagnosis.

²⁹PACs in which key technologies are provided are excluded under PPAC. Thus, the fifteen PACs eligible for PPAC reimbursement include: 2,4,5,6,8,9,10,12,14,16,18,19,20,22,25.

for ancillary services and procedures. Ancillary services and procedures performed during a visit will be billed separately using the customary Medicaid procedure codes and reimbursed according to customary Medicaid fee schedules.

PPAC physicians will submit Medicaid claims using one of six rate codes, depending on the site of service: **office**, hospital, emergency room, home, residential care facility, and domiciliary care. However, reimbursement will be based on **PACs** for only **office-based** visits. The PAC rates under PPAC were based on time per visit in D&T's (direct and indirect contact time). In addition, a 50 adjustment factor was added to account for the physician's overhead cost (e.g., similar to a facility component). Visits taking place in the other settings will be based on a flat rate, adjusted by region.

5.4 Summary

This report focuses on the feasibility of implementing the PAC system and does not address the validity of the classification matrix, or evaluate the effect on Medicaid **outlays**.³⁰ NYS DOH undertook a tremendous task in designing and implementing a case-mix based prospective reimbursement system for ambulatory care. Overall, **PACs** is simply an administrative and payment system which, according to representatives from a sample of demonstration facilities, appears to have had no impact in the clinical setting. In addition, facilities reported developing successful approaches to bundling ancillary services with visits. Given the recent changes in PAC assignment (e.g., fewer data elements required), implementation should be even easier.

Several lessons can be learned from the experiences of the demonstration facilities:

- * The ease with which a facility was able to match services with visits was highly dependent on the existing patient accounting (ID) system. This task was much more **difficult** where a patient was assigned a unique ID number, regardless of the data of service.
- * Encounter forms at most facilities required some modification to capture the necessary data elements; absent the need for evaluation on data, however, modifications would have been minor.
- * Installation of the PAC grouper was dependent on the flexibility and sophistication of the facility's data processing system. The level of integration of patient registration information with encounter and ancillary service data was critical to PAC assignment.

³⁰An analysis of the NYS evaluation data is currently underway. This analysis will examine the homogeneity of the PAC groups and estimate the financial impact of the PAC system on Medicaid outlays.

- * Facilities arranged contracts for ancillary services (both technical and professional) using existing relationships. Payment to vendors was generally based on previous payment levels. In general, facilities did not monitor vendors closely to determine whether duplicate billing was occurring.
- * Two approaches were undertaken to capture ancillary services: 1) the adoption of a suspense period; and 2) direct billing to Medicaid with quarterly "sweeps". It is not clear which approach is better, although the quarterly sweep may encourage a higher rate of claims resubmissions for adjustment billing. Further, the preferred system for the state may be different than that for facilities (which have concerns about reduced cash flow).
- * Facilities reported limited ability to "game", or "upcode", the PAC system.
- * None of the facilities reported using PACs as a management tool, either for monitoring utilization trends or physician behavior.³¹

While the administrative experiences of the demonstration facilities suggest that PACs can be implemented on a broader basis, facilities acknowledged that reimbursement under PACs affected a small proportion of a facility's revenue. Experiences under PACs where reimbursement affect a larger percentage of patients may reveal different behavior. For example, one could expect clinicians to be aware of the PAC system; or there might be more of a concerted effort and time devoted to ensuring that all key technology services are matched with services.

The new primary care initiatives, which will be based on PAC reimbursement, will further test its applicability on a wider basis. However, an analysis of the validity of the PAC groupings and expenditures is required before PACs can be formally recommended for all Medicaid ambulatory services.

³¹DRGs, which generally affect a substantially larger proportion of a facility's revenues than PACs, was only recently (1986) implemented in New York State. Given the long learning curve for prospective payment systems, hospitals have been paying more attention to how DRGs can be used as management tool, than how PACs can serve this purpose.

APPENDIX A

Site Visit Protocol Guide

Evaluation of the NYS **PACs** Demonstration Project
Abt Associates Inc.

Site Visit Protocol Guide

A. Facility Data/Background:

Facility Name
Location
Date of Visit
Principle and Secondary Contacts On-Site

Type of Facility:
Hospital OPD
D & T

Organizational Structure/Chart
Teaching Status/Resident Program
Affiliation
Ownership,

Date PACS Implemented
Date PACS Fully Operational
Date PAS Implemented
Date **DRGs** Implemented

Total Annual Outpatient Visits:
Surgical Visits
Non-Surgical Visits

Total % Outpatient Payer Mix:
Medicare
Medicaid
Blue Cross
Commercial
Other Insurance
Self-Pay

Outpatient Area Financial Performance
Organization Financial Performance

Materials: organization chart
brochures about facilities/services
training materials
internal memos

PACS Implementation and Operation

B. Implementation Period:

- Decision/Incentive to Participate
- Start-up time
- Support from NYS DOH
- Responsibility
- Implementation Plan
- Staff training/protocols
- Staff **Hiring/Reorganization/PAC** committees

C. Operations/Procedures:

1. Registration procedures:

- Encounter forms:
 - identification of PACs/payer code
 - modification of form
- new items:
 - new pt./new diag.
 - 1st prenatal visit/provider
 - pre/post adm
 - primary provider type
 - time increments
 - precoded** diagnoses/procedures
 - diagnosis/procedure assignment
 - keypunching
 - staff who complete it

Check in/out procedures

2. Ancillary Services - Lab, Radiology and Pharmacy

- verification of key technologies
- change in ordering procedures
- report generation

3. Financial Management:

- Information and Controls
- Budgeting
- Capital Expenditures - new equipment?
- Relation of **PACs** to costs & Prior
- Reimbursement
- Gain/loss for specific **PACs**
- Gain/loss for specific **DRGs**
- Report Generation
- Physician monitoring by PAC/key techs

4. Negotiation with outside vendors:

- dp
- radiology group
- lab group
- pathology group

5. Billing:

Procedures for claims submission to Medicaid
Procedures for claims submission from vendors
(e.g. radiologists)
Keypunching
Adjustments due to key technologies

6. Medical Records:

If involved with PACs:

Coding/PAC creep
Physician Relations
Time to Process Records
Report Generation

-7. Data Processing:

Overview of DP System(s)
Organization
Management
Program Development
Vendor(s)

PACs Grouper Installation:

Software/Grouper:
internal
vendor

Hardware:
pc
mainframe
mini

Design
Implementation Process
Performance
Modification(s) - Requirements & Easy
Support from DOH

D. Clinical Impacts

1. Clinician aware of PACs?
time spent to complete encounter data for PACs
aware of PAS/DRGs?
training of clinic staff
2. Utilization/Visit Patterns
Number
Time
Scheduling
Screening
Payor specific
3. Clinical Contact
Primary Physician
Referral Physicians
Staff Consultations & Multi-disciplinary Treatment
Nurse and Other Clinical Support Staff
Staff substitution
Staff specialization
4. Diagnostics
Use of Ancillary Services - Lab, Radiology &
Pharmacy
Use of Key Technologies
5. Patient Disposition
Admissions to Inpatient Care
Transfers to Other Facilities - ER or OPD
Other Changes in Practice Patterns

E. Patient Impacts

Quality of Care/Quality Assurance activities
Awareness of System
Access to Care
Satisfaction with Treatment

F. Overall Operational Evaluation

1. Classification
 - Clinically Meaningful?
 - PAC homogeneous?
 - Reimbursement equitable?
 - Modification & Adjustment - Internal and External
 - Provider acceptability
2. Reimbursement
 - updating factor
 - outliers
3. Administrative ease/flexibility
4. Satisfaction/Major Problems
5. Any benefits of participation?
6. Overall Impression
7. Comparison to Prior Systems/comparison to PAS
8. Needed Improvements
9. Potential to Expand - State-wide & National

APPENDIX B
Ambulatory Care Visit Survey
for
Developing the PACs Classification System

Source: New York State Department of Health, Office of Health Systems Management.

ID #

NY State Department of Health
OFFICE OF HEALTH SYSTEMS MANAGEMENT
Room 1168, Corning Tower Building, ESP, Albany, NY 12237

Ambulatory Care Visit Survey

RECEPTIONIST

1. Date DAY MONTH
(6) (8)

2. Medical Record Number (10)

3. Sex ☐ Male ☐ Female
(17)

4. Year of Birth (18)

5. Race/Ethnicity (check one) CI 1. White ☐ 2. Black ☐ 3. Hispanic ☐ 4. Other
(20)

6. Payor: Primary ☐ Secondary ☐ (21) (22)

0. Medicaid 2. Blue Cross 4. Workers' Compensation 6. Self pay 8. Employee Health
1. Medicare 3. HMO 5. Private insurance 7. No pay 9. Other (describe) _____

7. Is the patient: A. New to the facility? ☐ Yes ☐ No (26) B. New to the clinic? CI Yes ☐ No (27)

3. Source of Referral (check one) (28)
☐ 1. Walk-in ☐ 3. Scheduled revisit ☐ 5. Private MD ☐ 8. Inpatient service
CI 2. Self appointment CI 4. D & T center ☐ 6. Emergency room ☐ 9. Other (describe) _____
☐ 7. Other clinic _____

Has the patient been hospitalized in the last year? ☐ (p) ☐ No

PROFESSIONAL STAFF

10. Chief complaint or symptom of patient this visit - in patient's own words:

1. Reason for visit (check one) (30)

- ☐ 1. Acute problem
☐ 2. Acute problem, complicated by chronic condition
☐ 3. Chronic problem, routine
☐ 4. Chronic problem, flare-up

- ☐ 5. Well-care (health ed., routine pre-natal, gen. exam, well-baby, etc.)
☐ 6. Pre-admission workup
☐ 7. Follow-up to inpatient stay within 30 days

- CI 8. Follow-up to ambulatory surgery within 30 days
CI 9. Administrative (drug/supply pickup, paperwork, no professional time)

2. Social Problems (check all that apply) (31-40)

- ☐ 0. Communication limitations ☐ 3. Mentally retarded
☐ 1. Mobility disability ☐ 4. Alcoholism
☐ 2. Mentally ill ☐ 5. Housing

- ☐ 6. Medical non-compliance
☐ 7. Drug abuse
☐ 8. Financial
☐ 9. Other (describe) _____

ALL STAFF

13. All staff, except primary provider; put your identity code and time spent for patient before and after primary provider.

ID CODE MINUTES
(41) (57)

ID CODE MINUTES
(45)

ID CODE MINUTES
(49) (65)

ID CODE MINUTES
(51) (69)

01. Audiologist 05. LPN
02. Clerk/receptionist 06. MD consult
03. Counselor (non-MSW) 07. Midwife
04. Interpreter 08. Nurse's aide

09. Nurse practitioner
10. Nutritionist
11. Optician
12. Pharmacist

13. P.T./Rehab
14. Physician assistant
15. Psychologist
16. RN

17. Social worker (MSW)
18. Technician
19. Other

PRIMARY PROVIDER

14. Please enter: your 3 initials

(73)

personal contact minutes with the patient

(76)

non-contact minutes (chart, consult, test review)

(78)

15. Have you ever seen this patient before?

CI Yes ☐ No ☐
(80)

16. Is the patient's complete chart available?

CI Yes ☐ No ☐
(81)

17. Principal problem/diagnosis treated this visit. If diagnosis unknown, list primary symptom.

If well care, specify "gen exam", "well baby", "prenatal", "counseling", or "screening" (e.g. tine test, breast exam, paps, hypertension, etc.) and skip to 28.

18. Other current problems/diagnosis or medical conditions.

- a. _____
b. _____
c. _____
d. _____

19. How long has the patient had the principal problem?

☐ 1. 1-7 days ☐ 2. 8-30 days ☐ 3. 1-6 months ☐ 4. Over 6 months
(82)

20. Was a diagnosis for the principal problem known before today? CI Yes ☐ No ☐
(83)

21. Has patient been seen here before for the same principal problem? (84)

☐ 1. Yes, by myself ☐ 2. Yes, by others ☐ 3. No

21a. If yes, since the last visit, how has the patient's condition changed? (85)

☐ 1. Unchanged ☐ 2. Improved ☐ 3. Deteriorated (expected) ☐ 4. Deteriorated (unexpected)

22. Is patient's condition stable at time of this visit?

☐ Yes ☐ No
(86)

23. Was patient following prescribed therapy?

☐ N/A ☐ Yes ☐ No
(87)

24. Was patient receiving any medications prior to this visit?

☐ Yes ☐ No
(88)

25. Did patient present with any of the following symptoms or signs? (check all that apply) (89-100)

- | | | |
|--|---|---|
| <input type="checkbox"/> a. Pain | <input type="checkbox"/> e. Abnormal weight change | <input type="checkbox"/> i. Sleeping problems |
| <input type="checkbox"/> b. Fever | <input type="checkbox"/> f. Elimination problems | <input type="checkbox"/> j. Emotional distress |
| <input type="checkbox"/> c. Inflammation/infection | <input type="checkbox"/> g. Restricted mobility | <input type="checkbox"/> k. Restricted activities of daily living |
| <input type="checkbox"/> d. Dizziness/nausea | <input type="checkbox"/> h. Illness related absenteeism | <input type="checkbox"/> l. Other |

26. Is patient's principal problem complicated by secondary problems or therapeutic side effects?

☐ Yes ☐ No
(101)

27. When did patient need to be seen for the principal diagnosis? (102)

- | | |
|---|--|
| <input type="checkbox"/> 1. Immediate attention needed | <input type="checkbox"/> 3. Could have been deferred |
| <input type="checkbox"/> 2. Needed to be seen this week | <input type="checkbox"/> 4. Did not need to be seen |

28. Did you administer any medication or vaccines this visit?

☐ Yes ☐ No
(103)

29. Did you order any prescription or non-prescription drugs as a result of this visit?

☐ Yes ☐ No
(104)

30. List therapies, special exams/screening, health education, provided this visit. Print. Be specific. indicate duration. (DX-Tests, see question 31)

MINUTES		MINUTES	
a. _____	(107)	d. _____	(113)
b. _____	(109)	e. _____	(115)
c. _____	(111)	f. _____	(117)

31. Diagnostic/laboratory services provided this visit: (check all that apply)

Radiology

Nuclear Medicine

Laboratory

- (119) ☐ Abdomen, Single A-P
 (120) ☐ Ankle, Complete
 (121) ☐ Barium Enema
 (122) ☐ Cervical Spine, 4 Views
 (123) ☐ Cervical Spine, Complete
 (124) ☐ Chest, 1 View
 (125) ☐ Chest, 2 View
 (126) ☐ Chest, Complete
 (127) ☐ Elbow, Complete
 (128) ☐ Entire Spine
 (129) ☐ Esophagus
 (130) ☐ Fingers
 (131) ☐ Foot, 2 Views
 (132) ☐ Foot, Complete
 (133) ☐ Forearm and 1 Joint
 (134) ☐ Hand
 (135) ☐ Hip, 1 View
 (136) ☐ Hip, Complete
 (137) ☐ Hip and Pelvis
 (138) ☐ Humerus
 (139) ☐ I.V.P.
 (140) ☐ Knee, 1 View
 (141) ☐ Knee, 2 Views
 (142) ☐ Knee, Complete
 (143) ☐ Lumbar Spine, Complete
 (144) ☐ Lumbo-Sac Bending
 (145) ☐ Mandible
 (146) ☐ Nasal Bones
 (147) ☐ Orbits
 (148) ☐ Paranasal Complete
 (149) ☐ Paranasal Sinuses
 (150) ☐ Pelvimetry/Echography, Pelvis
 (151) ☐ Ribs, Unilateral
 (152) ☐ Shoulder, Complete
 (153) ☐ Skull
 (154) ☐ Thoracic Spine 2 Views
 (155) ☐ Tibula and Fibula and 1 Joint
 (156) ☐ T.M. Joints
 (157) ☐ Upper G.I.
 (158) ☐ Wrist, Complete

- (159) ☐ Bone Scan
 (160) ☐ Brain Scan
 (161) ☐ Heart Scan
 (162) ☐ Liver Scan
 (163) ☐ Lung Scan
 (164) ☐ Pelvic Scan

Sonic

- (165) ☐ Sonic Fetal Age
 (166) ☐ Sonic Pregnancy DX
 (167) ☐ Sonic Renal Scan
 (168) ☐ Sonic Pregnancy (Complete)
 (169) ☐ Echocardiograph (Complete)
 (170) ☐ Sonic Fetal Scan

EKG

- (171) ☐ EKG Standard 12 Lead

Orthopedics

- (172) ☐ Cast Repair (Any)
 (173) ☐ Cast Removal (Any)
 (174) ☐ Hand Cast
 (175) ☐ Long Arm Cast
 (176) ☐ Long Arm Splint
 (177) ☐ Long Leg Cast
 (178) ☐ Long Leg Splint
 (179) ☐ Short Arm Cast
 (180) ☐ Short Arm Splint
 (181) ☐ Short Leg Cast
 (182) ☐ Short Leg Splint
 (183) ☐ Wrist Cast

Other Tests

(please describe)

1. _____
 2. _____
 3. _____
 4. _____

- (184) ☐ SMAIASTRA 6
 (185) ☐ SMAIASTRA 12
 (186) ☐ SMAIASTRA 18
 (187) ☐ SMAIASTRA 24
 (188) ☐ Routine Liver Function Panel
 (189) ☐ Routine Thyroid Panel
 (190) ☐ Antinuclear Antibody
 (191) ☐ Antistreptolysin O Titre
 (192) ☐ Blood Occult (feces)
 (193) ☐ Blood, typing (ABO or RH)
 (194) ☐ Blood, Differential
 (195) ☐ CBC, Automated (RBC/WBC/HTC. Indices)
 (196) ☐ Cholesterol, HDL
 (197) ☐ Culture (Bacterial) Any Source
 (198) ☐ Culture and Sensitivity
 (199) ☐ Cytopathology other than Pap
 (200) ☐ Glucose Urine
 (201) ☐ Hematocrit
 (202) ☐ Hemoglobin Fractionation
 (203) ☐ Lead (blood or urine)
 (204) ☐ LDH
 (205) ☐ OVA and Paracites (feces)
 (206) ☐ Pap Smear
 (207) ☐ Platelet Count
 (208) ☐ Pregnancy Test
 (209) ☐ Prothrombin Time
 (210) ☐ Reticulocyte Count
 (211) ☐ Sedimentation Rate
 (212) ☐ Sickle Cell Determination
 (213) ☐ Smear for Organism
 (214) ☐ Syphilis Test
 (215) ☐ TB Tine Test
 (216) ☐ Throat Culture
 (217) ☐ Thyroid Stim. Hormone
 (218) ☐ Thyroxine (T4)
 (219) ☐ Tryglycerides
 (220) ☐ Urinalysis (routine)
 (221) ☐ Urine Culture

32. Disposition (check all that apply) (222-235)

- ☐ A. Return scheduled → CI b. 1-7 days ☐ c. 8-30 days CI d. over 30 days
☐ E. Return to referral source ☐ I. Referred to home health care ☐ M. Return PRN
☐ F. Referred to private MD ☐ J. Direct admission ☐ N. Referred to other facility
☐ G. Referred to emergency room ☐ K. Telephone follow-up
☐ H. Referred to social services ☐ L. Referred to other clinic in this facility

We would appreciate any additional comments you may have., Please use the space on the back of this form.
PLEASE COMPLETE BEFORE YOUR NEXT PATIENT THANK YOU!

APPENDIX C

PAC Definitions

Source: PAC Evaluation System Data Abstract Dictionary, NYS DOH, March 1988.

PAC DEFINITIONS

1. Well Care Examination, Child Age O-2

Patients & Services: This PAC represents well care exams for healthy newborns and children under three. Well care exams include physical exams, developmental checks, health education for the mother as warranted, and selected lab tests and screening procedures on appropriate schedules (e.g., PKU, Sickle Cell, Lead, TB Tine, Urinalysis, and Hematocrits.) There are no limits on the frequency of provision of this PAC to healthy children under three.

2. Annual Well Care Examination, Child Age 3-17

Patients & Services-- This PAC represents physical exams and health education visits for healthy children age three through seventeen. It should include a developmental appraisal, nutritional assessment, hearing and vision screening, and selected lab tests on appropriate schedules (e.g., hematocrit, blood counts, lead screening, tb tine, urinalysis and VD for teenagers.) This PAC is available on an annual basis for children between three and seventeen.

3. Diagnostic Investigation of Class I Problem, Child Age O-17

Patients & Services -- The patients in this PAC are children under eighteen with problems in the following areas: muscle skeletal, nutritional, ear, nasopharynx, respiratory, gastrointestinal, skin, infections, and injuries. These visits will include a physical examination and history with appropriate treatment and diagnostic measures including laboratory ancillaries and the use of key diagnostic technologies (ultrasounds, xrays, contrasts, EEGs and stress tests).

This PAC is available to all children under eighteen with the above problems when a key technology is provided as part of the visit (but not necessarily during the visit) and the facility is financially responsible for the key technology. Old patients should have a documented complete physical and history in their chart prior to this visit. For new patients, the chart should document a complete physical and history as a result of this visit. The use and frequency of key technologies should not exceed standard guidelines.

4. Management of Class I Problem, Child Age O-17

Patients & Services-- The patients in this PAC are children under eighteen with problems in the following areas: muscle skeletal, nutritional, ear, nasopharynx, respiratory; gastrointestinal, skin, infections, and injuries. These visits will include a physical examination and history with appropriate treatment and diagnostic measures including laboratory ancillaries, when necessary. This PAC is available to all children under eighteen with the above problems.

5. Medication Administration

Patients & Services--This PAC represents visits by any patient solely for the purpose of administering a drug (e.g., vaccination, inhalants, allergy shots, etc. except **chemotherapy**), or renewing a prescription with concomitant provider assessment.

6. Annual Examination, Adult over 17

Patients & Services-- This PAC represents annual physical exam and health education visits for generally healthy adults over seventeen. It should include a nutritional assessment, blood pressure, hearing, and vision screening, and selected ancillaries when appropriate. In addition to standard lab tests, some visits will involve the use of chest x-rays and mammograms. This PAC is available on an annual basis for patients over seventeen.

7. Diagnostic Investigation of Class II Problem, Adult Age Over 17

Patients & Services-- This PAC is for patients over seventeen with problems in the following areas: muscle skeletal, nutritional, ear, nasopharynx, respiratory, skin, infections, and injuries. These visits will include a physical examination and history with appropriate treatment and diagnostic measures including laboratory ancillaries and the use of key diagnostic technologies (ultrasounds, x-rays, contrasts, **EEGs** and stress tests) .

This PAC is available to all patients over seventeen with the above problems when a key technology is provided as part of the visit (but not necessarily during the visit) and the facility is financially responsible for the key technology. Old patients should have a documented complete physical and history in their chart prior to this visit. For new patients, the chart should document a complete physical and history as a result of this visit.

8. Management of Class II Problem, Adult Age Over 17

Patients & Services-- This PAC is for patients over seventeen with problems in the following areas: **muscle** skeletal, nutritional, ear, nasopharynx, respiratory, skin, infections, and injuries. These visits will include a physical examination **and history** with appropriate treatment and diagnostic measures including laboratory ancillaries This PAC is available to all patients over seventeen with the above problems.

9. Initial Prenatal Evaluation

Patients & Services-- This PAC represents visits by women with a confirmed pregnancy for the purpose of beginning pre-natal care. These visits will include a complete physical examination and history, nutritional counseling, health education, and appropriate treatment measures including laboratory ancillaries and the use of diagnostic **technologies**.

This PAC is available to any woman with a confirmed pregnancy coming in for her first pre-natal visit at a facility where ultrasounds can be provided as part of the visit (but not necessarily during the visit) and the facility is financially responsible for the ultrasounds when they are provided. This financial responsibility may be accomplished through 1.) direct provision of the ultrasound at the facility, or 2.) provision of the ultrasound at an alternate site with the charge for the ultrasound returned exclusively to the participating facility for payment by that facility.

10. Prenatal Revisits, Age Over 34 or Under 19

Patients & Services-- This PAC represents revisits by women with a confirmed pregnancy for the purpose of ongoing pre-natal care; These visits will include a limited physical examination, nutritional counseling, health education, and appropriate treatment and diagnostic measures including laboratory ancillaries and the use of diagnostic machinery.

This PAC is available to any woman under 19 and over 34 with a confirmed pregnancy coming in for a pre-natal revisit to a facility where ultrasounds can be provided as part of the visit (but not necessarily during the visit). and the facility is financially responsible when they are provided. This financial responsibility may be accomplished through 1.) direct provision of the ultrasound at the facility, or 2.) provision of the ultrasound at an alternate site with the charge for the ultrasound returned exclusively to the participating facility for payment by that facility.

11. Prenatal Revisits, Age 19-34

Patients & Services -- This PAC represents revisits by women with a confirmed pregnancy for the purpose of ongoing pre-natal care. These visits will include a limited physical. examination, nutritional counseling, health education, and appropriate treatment and diagnostic measures including laborntory ancillaries and the use of diagnostic machinery.

This PAC is available to any woman between 19 and 34 with a confirmed pregnancy coming in for a pre-natal revisit to a facility where ultrasounds can be provided as part of the visit (but not necessarily during the visit) and the facility is financially responsible when they are provided. This f inancinl responsibility may be accomplished through 1.) direct provision of the ultrasound at the facility, or 2.) provision of the ultrasound at an alternate site with the charge for the ultrasound returned exclusively to the participating facility for payment by that facility.

12. Annual Gynecological Examination

Patients/Services-- This PAC represents v i s i t s by women for annual GYN exams. These should include a physical exam and history (if not

previously obtained), health education, a full pelvic exam, pap smear, appropriate lab ancillaries and, for women over 40, as necessary, a mammogram. This PAC is available on an annual basis for women.

13. Diagnostic Investigation of Reproductive Problem

Patients/Services-- This PAC represents visits by women and men with reproductive problems. These visits will include a physical examination and history with appropriate diagnostic and treatment measures including laboratory ancillaries and the use of key diagnostic technologies (ultrasounds, xrays, contrasts, EEGs and stress tests).

This PAC is available to all patients with the above problems when a key technology is provided as part of the visit (but not necessarily during the visit) and the facility is financially responsible for the key technology. Old patients should have a documented complete physical and history in their chart prior to this visit. For new patients, the chart should document a complete physical and history as a result of this visit.

14. Management of Reproductive Problems

Patients/Services-- This PAC represents visits by women and men with reproductive problems. These visits will include a physical examination and history with appropriate diagnostic and treatment measures. Laboratory ancillaries are included in this PAC. This PAC is available to all women and men with reproductive health problems.

15. Diagnostic Investigation of Class III Problem

Patients & Services-- This PAC is for patients with problems in the following areas: adult digestive and hepatobiliary system, the nervous system, the circulatory system, the urological system, arthritis, rheumatism and other inflammatory/degenerative diseases of the joints and bones, diabetes and other metabolic problems and diseases of the endocrine system and pancreas, congenital disorders and newborns with problems, and patients with medical problems attendant to mental illness, alcohol and drug abuse, social problems, and physical medicine. These visits will include a physical examination and history with appropriate treatment and diagnostic measures including laboratory ancillaries and the use of key diagnostic technologies (ultrasounds, xrays, contrasts, EEGs and stress tests).

This PAC is available to all patients with the above problems when a key technology is provided as part of the visit (but not necessarily during the visit) and the facility is financially responsible for the key technology. Old patients should have a documented complete physical and history in their chart prior to this visit. For new patients, the chart should document a complete physical and history as a result of this visit.

16. Management of Class III Problem

Patients & Services-- This PAC is for patients with problems in the following areas: adult digestive and hepatobiliary system, the nervous system, the circulatory system, the urological system, arthritis, rheumatism and other inflammatory/degenerative diseases of the joints and bones, diabetes and other metabolic problems and diseases of the endocrine system and pancreas, congenital disorders and newborns with problems, and patients with medical problems attendant to mental illness, alcohol and drug abuse, social problems, and physical medicine. These visits will include a physical examination and history with appropriate treatment and diagnostic measures including laboratory ancillaries. This PAC is available to all patients with the above problems.

17. Diagnostic Investigation of Class IV Problem

Patients & Services-- This PAC is for patients with malignancies (excluding benign tumors and malignancies of the skin) myeloproliferative diseases of the blood and blood forming organs (except simple anemias). These visits will include a physical examination and history with appropriate treatment and diagnostic measures including laboratory ancillaries and the use of key diagnostic technologies (ultrasounds, xrays, 'contrasts, EEGs and stress tests).

This PAC is available to all patients with the above problems when a key technology is provided as part of the visit (but not necessarily during the visit) and the facility is financially responsible for the key technology. Old patients should have a documented complete physical and history in their chart prior to this visit. For new patients, the chart should document a complete physical and history as a result of this visit.

18. Management of Chemotherapy and Radiotherapy Treatments

Patients & Services-- This PAC is for patients with malignancies (excluding benign tumors and malignancies of the skin) myeloproliferative diseases of the blood and blood forming organs (except simple anemias). The patients must be currently undergoing a therapeutic regime to ameliorate symptoms or reverse or cure these problems. Therapies may include chemotherapy and radiation therapy or hyperthermia as an adjunct to radiation therapy. The patient may not actually receive therapy every visit. During visits when the patient does not actually receive therapy, the reason for the visit will be observation of the therapy's effects and the use of laboratory ancillaries necessary for managing and assessing the course of therapy.

19. Management of Class V Problem

Patients & Services-- This PAC is for patients with malignancies (excluding benign tumors and malignancies of the skin)

myeloproliferative diseases of the blood and blood forming organs (except simple anemias). These visits will include a physical examination and history with appropriate treatment and diagnostic measures including laboratory ancillaries.

20. Management of Class V Problem

Patients & Services -- This PAC represents visits where the primary purpose is providing supportive counseling and health education to patients with diagnosed mental illness- or substance abuse problems. These are not visits in which a medical work-up takes place. However, a minimal number of ancillaries to monitor the patient and the treatment are included as part of this PAC.

21. Audiological Testing

Patients & Services -- This PAC represents visits to Audiologists for audiology exams when the Audiologist is the primary provider.

22. Ophthalmological Services

Patients & Services -- This PAC represents visits to Ophthalmological clinics. These visits will include appropriate ophthalmological procedures as well as any laboratory ancillaries or diagnostic technologies required.

23. Speech and Rehabilitation Therapy

Patients & Services-- This PAC represents visits to Speech and Rehabilitation Therapists or clinics. These are therapy and treatment planning visits for any patient with diagnosed speech problems or physical disabilities requiring treatment by a speech or physical therapist. This PAC includes the necessary laboratory ancillaries to manage the course of treatment. (If a key technology is provided the visit is included in PAC 15.)

24. Diagnostic Investigation with Nuclear or Computerized Axial Tomography Imaging

Patients & Services-- This PAC represents visits by any patient who receives a CAT Scan or Diagnostic Nuclear Medicine services. This PAC includes all other laboratory and diagnostic technology ancillaries that are required to complete this diagnostic investigation. These are visits in which a CAT Scan or Diagnostic Nuclear Medicine is but one component of the visit; they are not usually visits with the sole purpose of receiving a CAT Scan or Nuclear medicine services. These visits should only occur after a complete physical and history.

APPENDIX D

PAC Assignment Algorithm Specifications

Source: PAC Evaluation System Data Abstract Dictionary, NYS DOH, March 1988

NEW YORK STATE
DEPARTMENT OF HEALTH
BUREAU OF AMBULATORY CARE REIMBURSEMENT

PRODUCTS OF AMBULATORY CARE
DEMONSTRATION PROJECT

PAC ASSIGNMENT ALGORITHM

PAC NUMBER: PAC 24

PAC NAME: DIAGNOSTIC INVESTIGATION WITH NUCLEAR
OR COMPUTERIZED AXIAL TOMOGRAPHY IMAGING

ASSIGNMENT ORDER: 1ST PAC ASSIGNED

KEYS TO ASSIGNMENT

DIAGNOSTIC
SERVICE
CATEGORIES: ANY DSC

AGE: ANY AGE

PRIMARY PROVIDER: ALL PRIMARY PROVIDERS

CLINIC SETTING: ANY CLINIC SETTING ELIGIBLE FOR PAC REIMBURSEMENT

ANCILLARIES: PATIENT MUST HAVE RECEIVED A CAT SCAN OR
DIAGNOSTIC NUCLEAR MEDICINE KEY TECHNOLOGY
TO BE ASSIGNED TO THIS PAC

ADDITIONAL THE APPROPRIATE IICPCS CODE FOR THE KEY
CONSIDERATIONS: TECHNOLOGY MUST BE ENTERED INTO THE
PAC SOFTWARE TO GENERATE ASSIGNMENT TO
THIS PAC

NEW YORK STATE
DEPARTMENT OF HEALTH
BUREAU OF AMBULATORY CARE REIMBURSEMENT

PRODUCTS OF AMBULATORY CARE
DEMONSTRATION PROJECT

PAC ASSIGNMENT ALGORITHM

PAC NUMBER: PAC 22

PAC NAME: OPHTHALMOLOGICAL SERVICES

ASSIGNMENT ORDER: 2ND PAC ASSIGNED

KEYS TO ASSIGNMENT

DIAGNOSTIC
SERVICE
CATEGORIES: ANY DSC

AGE: ANY AGE

PRIMARY PROVIDER: ALL PRIMARY PROVIDERS

CLINIC SETTING: ANY OPHTHALMOLOGY OR EYE CLINIC VISIT
(MMIS CLINIC SPECIALTY CODES 919 AND 958)

ANCILLARIES: PATIENTS RECEIVING KEY TECHNOLOGIES THAT
WERE SEEN IN OPHTHALMOLOGY CLINICS WILL STILL
BE ASSIGNED TO THIS PAC

ADDITIONAL THE OPHTHALMOLOGY CLINIC SPECIALTY CODES
CONSIDERATIONS: TRIGGER ASSIGNMENT TO THIS PAC. THIS
CODE SHOULD BE PRESENT FOR ALL EYE CLINIC
VISITS.

NEW YORK STATE
DEPARTMENT OF HEALTH
BUREAU OF AMBULATORY CARE REIMBURSEMENT

PRODUCTS OF AMBULATORY CARE
DEMONSTRATION PROJECT

PAC ASSIGNMENT ALGORITHM

PAC NUMBER: PAC 21

PAC NAME: AUDIOLOGICAL TESTING

ASSIGNMENT ORDER: 3RD PAC ASSIGNED

KEYS TO ASSIGNMENT

DIAGNOSTIC
SERVICE
CATEGORIES: ANY DSC

AGE: ANY AGE

PRIMARY PROVIDER: AUDIOLOGISTS
(MMIS PRIMARY PROVIDER CODE = 44)

CLINIC SETTING: ANY CLINIC SETTING NOT PREVIOUSLY ASSIGNED
THAT IS ELIGIBLE PAC REIMBURSEMENT

ANCILLARIES: PATIENTS RECEIVING A KEY TECHNOLOGY THAT
ARE SEEN BY AN AUDIOLOGIST WILL STILL
BE ASSIGNED TO THIS PAC

ADDITIONAL THE PRIMARY PROVIDER -CODE TRIGGERS
CONSIDERATIONS: ASSIGNMENT TO THIS PAC

NEW YORK STATE
DEPARTMENT OF HEALTH
BUREAU OF AMBULATORY CARE REIMBURSEMENT

PRODUCTS OF AMBULATORY CARE
DEMONSTRATION PROJECT

PAC ASSIGNMENT ALGORITHM

PAC NUMBER: PAC 23

PAC NAME: SPEECH AND REHABILITATION THERAPY

ASSIGNMENT ORDER: 4TH PAC ASSIGNED

KEYS TO ASSIGNMENT

DIAGNOSTIC
SERVICE
CATEGORIES: ANY DSC

AGE: ANY AGE

PRIMARY PROVIDER: SPEECH PATHOLOGISTS, PHYSICAL THERAPISTS
AND OCCUPATIONAL THERAPISTS
(MMIS PRIMARY PROVIDER CODE = 28,29,OR 41)

CLINIC SETTING: PHYSICAL THERAPY, REHABILITATION THERAPY,
SPEECH THERAPY, OCCUPATIONAL THERAPY
PHC SPEECH AND HEARING AND
PHC AMPUTEE CENTER
(MMIS CLINIC SPECIALTY CODES 920,921,923,
924,967,968)

ANCILLARIES: PATIENTS RECEIVING A KEY TECHNOLOGY WILL
NOT BE ASSIGNED TO THIS PAC AND WILL BE
ASSIGNED LATER IN THE ALGORITHM DEPENDING
UPON THEIR PRINCIPAL DIAGNOSIS

ADDITIONAL THE PRIMARY PROVIDER CODE AND CLINIC
CONSIDERATIONS: SPECIALTY CODES ARE BOTH EVALUATED BY THE
ALGORITHM IN DETERMINING ASSIGNMENT TO THIS
PAC

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PRODUCTS OF AMBULATORY CARE
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PAC ASSIGNMENT ALGORITHM

PAC NUMBER: PAC 17

PAC NAME: DIAGNOSTIC INVESTIGATION OF CLASS IV PROBLEM

ASSIGNMENT ORDER: 5TH PAC ASSIGNED

KEYS TO ASSIGNMENT

DIAGNOSTIC PRINCIPAL DIAGNOSIS MUST FALL IN THE
SERVICE ONCOLOGY-HEMATOLOGY DSC
CATEGORIES: (PAC DSC CODE = 14)

AGE: ANY AGE

PRIMARY PROVIDER: ANY PRIMARY PROVIDER NOT PREVIOUSLY ASSIGNED

CLINIC SETTING: ANY CLINIC SETTING NOT PREVIOUSLY ASSIGNED
THAT IS ELIGIBLE FOR PAC REIMBURSEMENT

ANCILLARIES: PATIENTS RECEIVING A KEY TECHNOLOGY WILL
FALL INTO THIS PAC, INCLUDED ARE ULTRASOUND,
EEG, XRAY, CARDIAC STRESS TESTING, CHEST
XRAYs, MAMMOGRAMS AND XRAYs WITH CONTRAST
MATERIAL

ADDITIONAL THE COMBINATION OF DSC 14 AND THE PRESENCE
CONSIDERATIONS: OF A KEY TECHNOLOGY ARE WHAT THE ALGORITHM
EVALUATES IN MAKING ASSIGNMENTS TO THIS
PAC

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DEMONSTRATION PROJECT

PAC ASSIGNMENT ALGORITHM

PAC NUMBER: PAC 18

PAC NAME: MANAGEMENT OF CHEMOTHERAPY AND RADIOTHERAPY
TREATMENTS

ASSIGNMENT ORDER: 6TH PAC ASSIGNED

KEYS TO ASSIGNMENT

-----THE PRINCIPAL DIAGNOSIS MUST FALL IN THE
ONCOLOGY-HEMATOLOGY DSC (PAC DSC = 14) AND
DIAGNOSTIC THE PRINCIPAL OR SECONARDARY DIAGNOSIS
SERVICE MUST INDICATE THE PATIENT IS RECEIVING
CATEGORIES: CHEMOTHERAPY OR RADIOTHERAPY
(ICD9-CM DIAGNOSES CODES V58.0 - V58.2)

AGE: ANY AGE

PRIMARY PROVIDER: ANY PRIMARY PROVIDER NOT PREVIOUSLY ASSIGNED

CLINIC SETTING: ANY CLINIC SETTING NOT PREVIOUSLY ASSIGNED
THAT IS ELIGIBLE FOR PAC REIMBURSEMENT

ANCILLARIES: ANCILLARY PROCEDURE CODES INDICATE THAT
THE PATIENT IS IN THE COURSE OF A
CHEMOTHERAPY OR RADIOTHERAPY TREATMENT
REGIMEN

ADDITIONAL THE ALGORITHM CHECKS THE PRINCIPAL AND
CONSIDERATIONS: SECONDARY DIAGNOSES AND THE PROCEDURE CODES
TO SEE IF A PATIENT IS UNDERGOING A
CHEMOTHERAPY OR RADIOTHERAPY TREATMENT
REGIMEN IN MAKING AN ASSIGNMENT TO THIS
PAC.
IF THE VISIT IS DURING AN OFF CYCLE OF A
CHEMOTHERAPY OR RADIOTHERAPY TREATMENT REGIMEN
IT SHOULD STILL BE ASSIGNED TO THIS PAC IF
THE PRIMARY PURPOSE OF THE VISIT IS ONGOING
MANAGEMENT OF THE THERAPY. IN THESE CASES THE
CHEMO-RADIOTHERAPY ICD-9-CM CODES SHOULD BE CODED
AS THE FIRST SECONDARY DIAGNOSIS AND THE ONCO-HEMO
PROBLEM CODED AS THE PRIMARY DIAGNOSIS.

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PAC ASSIGNMENT ALGORITHM

PAC NUMBER: PAC 19

'PAC NAME: MANAGEMENT OF CLASS IV PROBLEMS

ASSIGNMENT ORDER: 7TH PAC ASSIGNED

KEYS TO ASSIGNMENT

DIAGNOSTIC PRINCIPAL DIAGNOSIS MUST FALL IN THE
SERVICE ONCOLOGY • HEMATOLOGY DSC
CATEGORIES: (PAC DSC = 14)

AGE: ANY AGE

PRIMARY PROVIDER: ANY PRIMARY PROVIDER NOT PREVIOUSLY ASSIGNED

CLINIC SETTING: ANY CLINIC SETTING NOT PREVIOUSLY ASSIGNED
THAT IS ELIGIBLE FOR PAC REIMBURSEMENT

ANCILLARIES: PATIENT DID NOT RECEIVE ANY KEY TECHNOLOGIES
AND IS NOT IN A CHEMOTHERAPY OR RADIOTHERAPY
TREATMENT REGIMEN

ADDITIONAL THE PRESENCE OF A PRINCIPAL DIAGNOSIS IN
CONSIDERATIONS: DSC 14 AND THE ABSENCE OF KEY TECHNOLOGIES
AND CHEMOTHERAPY AND RADIOTHERAPY TREATMENT
CODES ARE WHAT TRIGGERS ASSIGNMENT TO THIS
PAC

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PRODUCTS OF AMBULATORY CARE
DEMONSTRATION PROJECT

PAC ASSIGNMENT ALGORITHM

PAC NUMBER: PAC 5

PAC NAME: MEDICATION ADMINISTRATION

ASSIGNMENT ORDER: 8TH PAC ASSIGNED

KEYS TO ASSIGNMENT

DIAGNOSTIC PRINCIPAL DIAGNOSIS MUST FALL IN THE
SERVICE MEDICATION ADMINISTRATION DSC
CATEGORIES: (PAC DSC = 24) OR HAVE A PRINCIPAL
DIAGNOSTIC OF ALLERGY
(ICD9-CM CODES 477.00 - 477.9)

AGE: ANY AGE

PRIMARY PROVIDER: ANY PRIMARY PROVIDER NOT PREVIOUSLY ASSIGNED

CLINIC SETTING: ANY CLINIC SETTING NOT PREVIOUSLY ASSIGNED
THAT IS ELIGIBLE FOR PAC REIMBURSEMENT

ANCILLARIES: PATIENT DID NOT RECEIVE ANY KEY TECHNOLOGIES

ADDITIONAL THE PRESENCE OF A PRINCIPAL DIAGNOSIS IN
CONSIDERATIONS: DSC 24, AND THE ABSENCE OF KEY TECHNOLOGIES .
WILL RESULT IN AN ASSIGNMENT TO THIS PAC.
A PRINCIPAL DIAGNOSIS OF ALLERGY FOR AN
ESTABLISHED CLINIC PATIENT WHO DID NOT
RECEIVE ANY KEY TECHNOLOGIES WILL ALSO
GENERATE AN ASSIGNMENT TO THIS PAC.

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DEMONSTRATION PROJECT

PAC ASSIGNMENT ALGORITHM

PAC NUMBER: PAC 20

PAC NAME: MANAGEMENT OF CLASS V PROBLEMS

ASSIGNMENT ORDER: 9TH PAC ASSIGNED

KEYS TO ASSIGNMENT

DIAGNOSTIC PRINCIPAL DIAGNOSIS MUST FALL IN THE
SERVICE MENTAL AND SOCIAL PROBLEMS, ALCOHOL AND
CATEGORIES: DRUG ABUSE DSC (PAC DSC=9) AND THE
SECONDARY DIAGNOSIS MUST ALSO FALL WITHIN
THIS DSC OR BE ABSENT

AGE: ANY AGE

PRIMARY PROVIDER: ANY PRIMARY PROVIDER NOT PREVIOUSLY ASSIGNED

CLINIC SETTING: ANY CLINIC SETTING NOT PREVIOUSLY ASSIGNED
THAT IS ELIGIBLE FOR PAC REIMBURSEMENT

ANCILLARIES: PATIENT DID NOT RECEIVE ANY KEY TECHNOLOGIES

ADDITIONAL THE PRESENCE OF A PRINCIPAL DIAGNOSIS IN
CONSIDERATIONS: DSC 9, A SECONDARY DIAGNOSIS IN DSC 9 (OR THE
THE ABSENCE OF A SECONDARY DIAGNOSIS)
AND THE ABSENCE OF KEY TECHNOLOGIES WILL
GENERATE AN ASSIGNMENT TO THIS PAC.
PATIENTS RECEIVING A KEY TECHNOLOGY WILL BE
ASSIGNED TO PAC 15.

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DEMONSTRATION PROJECT

PAC ASSIGNMENT ALGORITHM

PAC NUMBER: PAC 9

PAC NAME: INITIAL PRENATAL EVALUATION

ASSIGNMENT ORDER: 10TH PAC ASSIGNED

KEYS TO ASSIGNMENT

DIAGNOSTIC PRINCIPAL DIAGNOSIS MUST FALL IN THE
SERVICE PREGNANCY DSC (PAC DSC = 15) AND THE
CATEGORIES: PATIENT'S SEX MUST BE FEMALE OR THE PRINCIPAL
DIAGNOSTIC MUST FALL IN THE FETAL DSC
(PAC DSC = 11) AND THE PATIENT MUST BE
FEMALE AND OLDER THAN 7

AGE: THE PATIENT MUST BE OLDER THAN 7 FOR
PRINCIPAL DIAGNOSES ASSIGNED TO DSC 11

PRIMARY PROVIDER: ANY PRIMARY PROVIDER NOT PREVIOUSLY ASSIGNED

CLINIC SETTING: ANY CLINIC SETTING NOT PREVIOUSLY ASSIGNED
THAT IS ELIGIBLE FOR PAC REIMBURSEMENT

ANCILLARIES: ANCILLARY PROCEDURES ARE NOT EVALUATED IN
GENERATING AN ASSIGNMENT TO THIS PAC

ADDITIONAL THE PRINCIPAL DIAGNOSIS MUST INDICATE
CONSIDERATIONS: PREGNANCY OR A FETAL DISORDER AND THE
NEW PREGNANCY INPUT VARIABLE MUST INDICATE
THAT THIS VISIT IS FOR AN INITIAL PRENATAL
EVALUATION

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DEMONSTRATION PROJECT

PAC ASSIGNMENT ALGORITHM

PAC NUMBER: PAC 10

PAC NAME: PRENATAL REVISITS FOR PATIENTS OVER 34 AND
UNDER AGE 19

ASSIGNMENT ORDER: 11TH PAC ASSIGNED

KEYS TO ASSIGNMENT

DIAGNOSTIC PRINCIPAL DIAGNOSIS MUST FALL IN THE
SERVICE PREGNANCY DSC (PAC DSC = 15) AND THE
CATEGORIES: PATIENT'S SEX MUST BE FEMALE OR THE PRINCIPAL
DIAGNOSIS MUST FALL IN THE FETAL DSC
(PAC DSC = 11) AND THE PATIENT MUST BE
FEMALE AND OLDER THAN 7

AGE: THE PATIENT MUST BE OLDER THAN 34 OR
YOUNGER THAN AGE 19

PRIMARY PROVIDER: ANY PRIMARY PROVIDER NOT PREVIOUSLY ASSIGNED

CLINIC SETTING: ANY CLINIC SETTING NOT PREVIOUSLY ASSIGNED
THAT IS ELIGIBLE FOR PAC REIMBURSEMENT

ANCILLARIES: ANCILLARY PROCEDURES ARE NOT EVALUATED IN
GENERATING AN ASSIGNMENT TO THIS PAC

ADDITIONAL THE PRINCIPAL DIAGNOSIS MUST INDICATE
CONSIDERATIONS: PREGNANCY OR A FETAL DISORDER AND THE
NEW PREGNANCY INPUT VARIABLE MUST INDICATE
THAT THIS VISIT IS FOR A PRENATAL REVISIT

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DEMONSTRATION PROJECT

PAC ASSIGNMENT ALGORITHM

PAC NUMBER: PAC 11

PAC NAME: PRENATAL REVISITS FOR PATIENTS AGE 19 - 34

ASSIGNMENT ORDER: 12TH PAC ASSIGNED

KEYS TO ASSIGNMENT

DIAGNOSTIC PRINCIPAL DIAGNOSIS MUST FALL IN THE
SERVICE PREGNANCY DSC (PAC DSC = 15) AND THE
CATEGORIES: PATIENTS SEX MUST BE FEMALE OR THE PRINCIPAL
DIAGNOSIS MUST FALL IN THE FETAL DSC
(PAC DSC = 11) AND THE PATIENT MUST BE
FEMALE AND OLDER THAN 7

AGE: THE PATIENTS MUST FALL IN THE RANGE.19 - 34

PRIMARY PROVIDER: ANY PRIMARY PROVIDER NOT PREVIOUSLY ASSIGNED

CLINIC SETTING: ANY CLINIC SETTING NOT PREVIOUSLY ASSIGNED
THAT IS ELIGIBLE FOR PAC REIMBURSEMENT

ANCILLARIES: ANCILLARY PROCEDURES ARE NOT EVALUATED IN
GENERATING AN ASSIGNMENT TO THIS PAC

ADDITIONAL THE PRINCIPAL DIAGNOSIS MUST INDICATE
CONSIDERATIONS: PREGNANCY OR A FETAL DISORDER AND THE
NEW PREGNANCY INPUT VARIABLE MUST INDICATE
THAT THIS VISIT IS I-OR A PRENATAL REVISIT

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PAC ASSIGNMENT ALGORITHM

PAC NUMBER: PAC 12

PAC NAME: ANNUAL GYNECOLOGICAL EXAMINATION

ASSIGNMENT ORDER: 13TH PAC ASSIGNED

KEYS TO ASSIGNMENT

DIAGNOSTIC THE PRINCIPAL DIAGNOSIS MUST INDICATE A
SERVICE GYNECOLOGICAL EXAMINATION
CATEGORIES: (ICD9 - CM CODE = V72.3)

AGE: ANY AGE

PRIMARY PROVIDER: ANY PRIMARY PROVIDER NOT PREVIOUSLY ASSIGNED

CLINIC SETTING: ANY CLINIC SETTING NOT PREVIOUSLY ASSIGNED
THAT IS ELIGIBLE FOR PAC REIMBURSEMENT

ANCILLARIES: CHEST X-RAYS AND MAMMOGRAMS ARE INCLUDED IN
THIS PAC
THE PRESENCE OF ANY OTHER KEY TECHNOLOGY
WILL RESULT IN AN ASSIGNMENT TO PAC 13

ADDITIONAL THE PRINCIPAL DIAGNOSIS MUST INDICATE
CONSIDERATIONS: AN ANNUAL GYNECOLOGICAL EXAMINATION AND KEY
TECHNOLOGIES MUST NOT BE PRESENT EXCEPT FOR
CHEST X-RAYS AND MAMMOGRAMS

PAC NUMBER: PAC 13

PAC NAME: DIAGNOSTIC INVESTIGATION OF REPRODUCTIVE
PROBLEM

ASSIGNMENT ORDER: 14TH PAC ASSIGNED

KEYS TO ASSIGNMENT

DIAGNOSTIC THE PRINCIPAL DIAGNOSIS MUST INDICATE A
SERVICE REPRODUCTIVE DISORDER (PAC DSC = 17)
CATEGORIES:

AGE: ANY AGE

PRIMARY PROVIDER: ANY PRIMARY PROVIDER NOT PREVIOUSLY ASSIGNED

CLINIC SETTING: ANY CLINIC SETTING NOT PREVIOUSLY ASSIGNED
THAT IS ELIGIBLE FOR PAC REIMBURSEMENT

ANCILLARIES, : THE PRESENCE OF A KEY TECHNOLOGY WILL
GENERATE AN ASSIGNMENT TO THIS PAC

ADDITIONAL THE COMBINATION OF A REPRODUCTIVE DISORDER
CONSIDERATIONS: AND A KEY TECHNOLOGY WILL RESULT IN AN
ASSIGNMENT TO THIS PAC

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PRODUCTS OF AMBULATORY CARE
DEMONSTRATION PROJECT

PAC ASSIGNMENT ALGORITHM

PAC NUMBER: PAC 14

PAC NAME: MANAGEMENT OF A REPRODUCTIVE PROBLEM

ASSIGNMENT ORDER: 15TH PAC ASSIGNED

KEYS TO ASSIGNMENT

DIAGNOSTIC THE PRINCIPAL DIAGNOSIS MUST INDICATE A
SERVICE REPRODUCTIVE DISORDER (PAC DSC = 17)
CATEGORIES:

AGE: ANY AGE

PRIMARY PROVIDER: ANY PRIMARY PROVIDER NOT PREVIOUSLY ASSIGNED

CLINIC SETTING: ANY CLINIC SETTING NOT PREVIOUSLY ASSIGNED
THAT IS ELIGIBLE FOR PAC REIMBURSEMENT

ANCILLARIES: NO KEY TECHNOLOGIES ARE INCLUDED IN THIS PAC

ADDITIONAL THE COMBINATION OF A REPRODUCTIVE DISORDER
CONSIDERATIONS: AND THE ABSENCE OF KEY TECIINOLOGIES WILL
RESULT IN AN ASSIGNMENT TO THIS PAC

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PAC ASSIGNMENT ALGORITHM

PAC NUMBER : PAC 15

PAC NAME: DIAGNOSTIC INVESTIGATION OF A CLASS III PROBLEM

ASSIGNMENT ORDER: 16TH PAC ASSIGNED

KEYS TO ASSIGNMENT

DIAGNOSTIC FOR PATIENTS UNDER AGE 18 THE PRINCIPAL
SERVICE DIAGNOSIS MUST BE IN THE ARTHRITIS, REHAB,
CATEGORIES: CIRCULATORY, CONGENITAL, ENDOCRINE, MENTAL &
SOCIAL PROBLEMS, NEUROLOGY AND UROLOGY DSCS
(PAC DSCS = 1,2,3,5,9,12,16,22)
FOR PATIENTS 18 OR OLDER THE PRINCIPAL
DIAGNOSIS MUST BE IN THE ARTHRITIS, REHAB,
CIRCULATORY, CONGENITAL, ENDOCRINE, MENTAL &
SOCIAL PROBLEMS, NEUROLOGY, UROLOGY AND
GASTRO-INTESTINAL DSCS .
(PAC DSCS = 1,2,3,5,7,9,12,16,22)

AGE: SEE ABOVE. THE GASTRO - INTESTINAL DSC IS
INCLUDED FOR PATIENTS 18 AND OLDER.

PRIMARY PROVIDER: ANY PRIMARY PROVIDER NOT PREVIOUSLY ASSIGNED

CLINIC SETTING: ANY CLINIC SETTING NOT PREVIOUSLY ASSIGNED
THAT IS ELIGIBLE FOR PAC REIMBURSEMENT

ANCILLARIES: PATIENTS RECEIVING A KEY TECHNOLOGY WILL
FALL INTO THIS PAC, INCLUDED ARE ULTRASOUND,
EEG, XRAY, CARDIAC STRESS TESTING, CHEST
XRAYs, MAMMOGRAMS AND XRAYs WITH CONTRAST
MATERIAL

ADDITIONAL THE COMBINATION OF AGE AND DSCS AS
CONSIDERATIONS: INDICATED ABOVE AND THE PRESENCE OF ANY
KEY TECHNOLOGY WILL RESULT IN AN ASSIGNMENT
TO THIS PAC

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PAC ASSIGNMENT ALGORITHM

PAC NUMBER: PAC 16

PAC NAME: MANAGEMENT OF A CLASS 3 PROBLEM

ASSIGNMENT ORDER: 17TH PAC ASSIGNED

KEYS TO ASSIGNMENT

DIAGNOSTIC FOR PATIENTS UNDER AGE 18 THE PRINCIPAL
SERVICE DIAGNOSIS MUST BE IN THE ARTHRITIS, REHAB
CATEGORIES: CIRCULATORY, CONGENITAL, ENDOCRINE, MENTAL &
SOCIAL PROBLEMS, NEUROLOGY AND UROLOGY DSCS
(PAC DSCS = 1,2,3,5,9,12,16,22)
FOR PATIENTS 18 OR OLDER THE PRINCIPAL
DIAGNOSIS MUST BE IN THE ARTHRITIS, REHAB
CIRCULATORY, CONGENITAL, ENDOCRINE, MENTAL &
SOCIAL PROBLEMS, NEUROLOGY, UROLOGY AND
GASTRO-INTESTINAL DSCS
(PAC DSCS = 1,2,3,5,7,9,12,16,22)

AGE: SEE ABOVE. 'THE GASTRO - INTESTINAL DSC IS
INCLUDED FOR PATIENTS 18 AND OLDER

PRIMARY PROVIDER: ANY PRIMARY PROVIDER NOT PREVIOUSLY ASSIGNED

CLINIC SETTING: ANY CLINIC SETTING NOT PREVIOUSLY ASSIGNED
THAT IS ELIGIBLE FOR PAC REIMBURSEMENT

ANCILLARIES: NO KEY TECHNOLOGIES ARE INCLUDED IN THIS
PAC

ADDITIONAL THE COMBINATION OF AGE AND DSCS AS
CONSIDERATIONS: INDICATED ABOVE AND THE ABSENCE OF ANY
KEY TECHNOLOGY WILL RESULT IN AN ASSIGNMENT
TO THIS PAC

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PAC ASSIGNMENT ALGORITHM

PAC NUMBER: PAC 1

PAC NAME: WELL CARE EXAMINATION, CHILD AGE 0-2

ASSIGNMENT ORDER: 18TH PAC ASSIGNED

KEYS TO ASSIGNMENT

DIAGNOSTIC THE PRINCIPAL DIAGNOSIS MUST FALL WITHIN THE
SERVICE WELL CARE DSC (PAC DSC = 23)
CATEGORIES:

AGE: AGES 0 TO 2

PRIMARY PROVIDER: ANY PRIMARY PROVIDER NOT PREVIOUSLY ASSIGNED

CLINIC SETTING: ANY CLINIC SETTING NOT PREVIOUSLY ASSIGNED
THAT IS ELIGIBLE FOR PAC REIMBURSEMENT

ANCILLARIES: SO KEY TECHNOLOGIES ARE INCLUDED IN THIS
PAC

ADDITIONAL THE COMBINATION OF AGE AND DSC AND THE
CONSIDERATIONS: ABSENCE OF ANY KEY TECHNOLOGY WILL RESULT
IN AN ASSIGNMENT TO THIS PAC.
THERE ARE NO RESTRICTIONS ON THE NUMBER OF
TIMES THIS PAC CAN BE FILLED DURING THE YEAR

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PAC ASSIGNMENT ALGORITHM

PAC NUMBER: PAC 2

PAC NAME: ANNUAL WELL CARE EXAMINATION, CHILD AGE 3-17

ASSIGNMENT ORDER: 19TH PAC ASSIGNED

KEYS TO ASSIGNMENT

DIAGNOSTIC THE PRINCIPAL DIAGNOSIS MUST FALL WITHIN THE
SERVICE WELL CARE DSC (PAC DSC = 23)

CATEGORIES:

AGE: AGES 3 TO 17

PRIMARY PROVIDER: ANY PRIMARY PROVIDER NOT PREVIOUSLY ASSIGNED

CLINIC SETTING: ANY CLINIC SETTING NOT PREVIOUSLY ASSIGNED
THAT IS ELIGIBLE FOR PAC REIMBURSEMENT

ANCILLARIES: NO KEY TECHNOLOGIES ARE INCLUDED IN THIS
PAC

ADDITIONAL THE COMBINATION OF AGE AND DSC AND THE
CONSIDERATIONS: ABSENCE OF ANY KEY TECHNOLOGY WILL RESULT
IN AN ASSIGNMENT TO THIS PAC
THIS PAC CAN ONLY BE BILLED ONCE A YEAR
SUBSEQUENT WELL CARE VISITS FOR THIS AGE
GROUP OCCURRING DURING THE YEAR WILL BE
BILLED TO PAC 4

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PRODUCTS OF AMBULATORY CARE
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PAC ASSIGNMENT ALGORITHM

PAC NUMBER: PAC 6

PAC NAME: ANNUAL EXAMINATION, ADULT OVER AGE 17

ASSIGNMENT ORDER: 20TH PAC ASSIGNED

KEYS TO ASSIGNMENT

DIAGNOSTIC THE PRINCIPAL DIAGNOSIS MUST FALL WITHIN THE
SERVICE WELL CARE DSC (PAC DSC = 23)

CATEGORIES:

AGE: AGES 18 AND OLDER

PRIMARY PROVIDER: ANY PRIMARY PROVIDER NOT PREVIOUSLY ASSIGNED

CLINIC SETTING: ANY CLINIC SETTING NOT PREVIOUSLY ASSIGNED
THAT IS ELIGIBLE FOR PAC REIMBURSEMENT

ANCILLARIES: CHEST X-RAYS AND MAMMOGRAMS ARE INCLUDED IN
THIS PAC ALL OTHER KEY TECHNOLOGIES ARE
EXCLUDED

ADDITIONAL THE COMBINATION OF AGE AND DSC AND THE
CONSIDERATIONS: ABSENCE OF ANY KEY TECHNOLOGY EXCEPT
CHEST X-RAYS AND MAMMOGRAMS WILL RESULT IN
AN ASSIGNMENT TO THIS PAC.
THIS PAC CAN ONLY BE BILLED ONCE A YEAR
SUBSEQUENT WELL CARE VISITS FOR THIS AGE
GROUP OCCURRING DURING THE YEAR WILL BE
BILLED TO PAC 8.

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PAC ASSIGNMENT ALGORITHM

PAC NUMBER: PAC 3

PAC NAME: DIAGNOSTIC INVESTIGATION OF A CLASS I
PROBLEM, CHILD AGE 0 - 17

ASSIGNMENT ORDER: 21ST PAC ASSIGNED

KEYS TO ASSIGNMENT

DIAGNOSTIC THIS PAC INCLUDES ALL DSCS FOR PATIENTS AGE
SERVICE 0 - 17 THAT HAVE NOT RESULTED IN A PREVIOUS
CATEGORIES: ASSIGNMENT (MUSCLE SKELETAL, NUTRITIONAL, EAR,
RESPIRATORY & NASOPHARYNX, GASTROINTESTINAL,
SKIN, INFECTIONS & INJURIES, NOT OTHERWISE SPECIFIED.)

AGE: AGES 0 TO 17

PRIMARY PROVIDER: ANY PRIMARY PROVIDER NOT PREVIOUSLY ASSIGNED

CLINIC SETTING: ANY CLINIC SETTING NOT PREVIOUSLY ASSIGNED
THAT IS ELIGIBLE FOR PAC REIMBURSEMENT

ANCILLARIES: PATIENTS RECEIVING A KEY TECHNOLOGY WILL
FALL INTO THIS PAC, INCLUDED ARE ULTRASOUND,
EEG, XRAY, CARDIAC STRESS TESTING, CHEST
XRAYS, MAMMOGRAMS AND XRAYS WITH CONTRAST
MATERIALS. .

ADDITIONAL THE COMBINATION OF AGE AND THE PRESENCE
CONSIDERATIONS: OF A KEY TECHNOLOGY WILL RESULT IN AN
ASSIGNMENT TO THIS PAC
THIS PAC WILL CAPTURE ALL THOSE CASES FOR
PATIENTS AGE 0 - 17 THAT RECEIVED A KEY
TECHNOLOGY AND THAT COULD NOT BE ASSIGNED
TO ONE OF THE PRECEDING PACS

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PAC ASSIGNMENT ALGORITHM

PAC NUMBER: PAC 4

PAC NAME: MANAGEMENT OF A CLASS I PROBLEM CHILD
0 - 17

ASSIGNMENT ORDER: 22ND PAC ASSIGNED

KEYS TO ASSIGNMENT

DIAGNOSTIC THIS PAC INCLUDES ALL DSCS FOR PATIENTS AGE
SERVICE 0 - 17 THAT HAVE NOT RESULTED IN A PREVIOUS
CATEGORIES: ASSIGNMENT (MUSCLE SKELETAL, NUTRITIONAL, EAR,
RESPIRATORY & NASOPHARYNX, GASTROINTESTINAL,
SKIN, INFECTIONS & INJURIES, NOT OTHERWISE SPECIFIED.)

AGE: AGES 0 TO 17

PRIMARY PROVIDER: ANY PRIMARY PROVIDER NOT PREVIOUSLY ASSIGNED

CLINIC SETTING: ANY CLINIC SETTING NOT PREVIOUSLY ASSIGNED
THAT IS ELIGIBLE FOR PAC REIMBURSEMENT

ANCILLARIES: NO KEY TECHNOLOGIES ARE INCLUDED IN THIS
PAC

ADDITIONAL THE COMBINATION OF AGE AND THE ABSENCE
CONSIDERATIONS: OF A KEY TECHNOLOGY WILL RESULT IN AN
ASSIGNMENT TO THIS PAC
THIS PAC WILL CAPTURE ALL THOSE CASES FOR
PATIENTS AGE 0 - 17 THAT DID NOT RECEIVE A
KEY TECHNOLOGY AND THAT COULD NOT BE
ASSIGNED TO ONE OF THE PRECEDING PACS

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PAC ASSIGNMENT ALGORITHM

PAC NUMBER: PAC 7

PAC NAME: DIAGNOSTIC INVESTIGATION OF A CLASS II
PROBLEM, ADULT AGE OVER 17

ASSIGNMENT ORDER: 23RD PAC ASSIGNED

KEYS TO ASSIGNMENT

DIAGNOSTIC THIS PAC INCLUDES ALL DSCS FOR PATIENTS AGE
SERVICE 18 AND OLDER THAT HAVE NOT RESULTED IN A
CATEGORIES: PREVIOUS ASSIGNMENT (MUSCLE SKELETAL, NUTRITIONAL,
EAR, RESPIRATORY & NASOPHARYNX, SKIN, INFECTIONS&
INJURIES, NOT OTHERWISE SPECIFIED.)

AGE: AGES 18 AND OLDER

PRIMARY PROVIDER: ANY PRIMARY PROVIDER NOT PREVIOUSLY ASSIGNED

CLINIC SETTING: ANY CLINIC SETTING NOT PREVIOUSLY ASSIGNED
THAT IS ELIGIBLE FOR PAC REIMBURSEMENT

ANCILLARIES: PATIENTS RECEIVING A KEY TECHNOLOGY WILL
FALL INTO THIS PAC, INCLUDED ARE ULTRASOUND,
EEG, XRAY, CARDIAC STRESS TESTING, CHEST
XRAYs, MAMMOGRAMS AND XRAYs WITH CONTRAST
MATERIALS

ADDITIONAL THE COMBINATION OF AGE AND THE PRESENCE
CONSIDERATIONS: OF A KEY TECHNOLOGY WILL RESULT IN AN
ASSIGNMENT TO THIS PAC
THIS PAC WILL CAPTURE ALL THOSE CASES FOR
PATIENTS AGE 18 AND OLDER THAT RECEIVED A
KEY TECHNOLOGY AND THAT COULD NOT BE
ASSIGNED TO ONE OF THE PRECEDING PACS

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PAC ASSIGNMENT ALGORITHM

PAC NUMBER: PAC 8

PAC NAME: MANAGEMENT OF A CLASS II PROBLEM, ADULT
AGE OVER 17

ASSIGNMENT ORDER: 24TH PAC ASSIGNED

KEYS TO ASSIGNMENT

DIAGNOSTIC THIS PAC INCLUDES ALL DSCS FOR PATIENTS AGE
SERVICE 18 AND OLDER THAT HAVE NOT RESULTED IN A
CATEGORIES: PREVIOUS ASSIGNMENT (MUSCLE SKELETAL, NUTRITIONAL,
EAR, RESPIRATORY & NASOPHARYNX, SKIN, INFECTIONS&
INJURIES, NOT OTHERWISE SPECIFIED.) .

AGE: AGES 18 AND OLDER

PRIMARY PROVIDER: ANY PRIMARY PROVIDER NOT PREVIOUSLY ASSIGNED

CLINIC SETTING: ANY CLINIC SETTING NOT PREVIOUSLY ASSIGNED
THAT IS ELIGIBLE FOR PAC REIMBURSEMENT

ANCILLARIES: NO KEY TECHNOLOGIES ARE INCLUDED IN THIS
PAC

ADDITIONAL THE COMBINATION OF AGE AND THE PRESENCE
CONSIDERATIONS: OF A KEY TECHNOLOGY WILL RESULT IN AN
ASSIGNMENT TO THIS PAC
THIS PAC WILL CAPTURE ALL THOSE CASES FOR
PATIENTS AGE 18 AND OLDER THAT DID NOT
RECEIVE A KEY TECHNOLOGY AND THAT COULD NOT
BE ASSIGNED TO ONE OF THE PRECEDING PACS

APPENDIX 2

TABLE A.1

PERCENT OF VISITS WITH AN ANCILLARY PROCEDURE
(nanc)

*Key Technology PAC

<u>PAC#</u>	<u>DESCRIPTION</u>	<u>ALL FACILITIES</u>		<u>HOSPITALS</u>		<u>D & T's</u>	
		<u>PRE</u>	<u>POST</u>	<u>PRE</u>	<u>POST</u>	<u>PRE</u>	<u>POST</u>
	ALL PACS	(n=10317) 45.5%	(n=47347) 51.6% . .	(n=8003) 45.3%	(n=26884) 48.8% . .	(n=2314) 46.2%	(n=20463) 55.3% .
1	Well Care, 0-2	(n=652) 26.7%	(n=2587) 26.2%	(n=454) 21.6%	(n=1394) 21.2%	(n=198) 38.4%	(n=1193) 32.1% +
2	Annual Well Care Exam 3-17	(n=479) 44.5%	(n=2543) 43.8%	(n=416) 40.1%	(n=1354) 34.9% +	(n=63) 73.0%	(n=1189) 53.8% *
3	Diagnostic Investigation Class 1, 0-17	(n=195) 100.0%	(n=1643) 100.0%	(n=183) 100.0%	(n=952) 100.0%	(n=12) 100.0%	(n=691) 100.0%
4	Management Class 1	(n=906) 26.5%	(n=2587) 17.2% . .	(n=599) 30.1%	(n=1394) 15.4% . .	(n=307) 19.5%	(n=1193) 19.4%
5	Medication Administration	(n=308) 27.3%	(n=2424) 18.1% . .	(n=293) 28.0%	(n=1391) 15.0% . .	(n=15) 13.3%	(n=1033) 22.4%
6	Annual Well Care Exam Over 17	(n=484) 52.3%	(n=2401) 51.6%	(n=351) 53.8%	(n=1318) 50.0%	(n=133) 48.1%	(n=1083) 53.6%
7	Diagnostic Investigation Class 2, Over 17	(n=385) 100.0%	(n=2470) 100.0%	(n=324) 100.0%	(n=1284) 100.0%	(n=61) 100.0%	(n=1186) 100.0%
8	Management Class 2, Over 17	(n=908) 24.8%	(n=2592) 22.6%	(n=599) 21.2%	(n=1401) 20.4%	(n=309) 31.7%	(n=1191) 25.3%
9	Initial Prenatal Evaluation	(n=94) 76.6%	(n=1834) 75.0%	(n=74) 75.7%	(n=830) 79.3%	(n=20) 80.0%	(n=1004) 71.3%

TABLE A.1

PERCENT OF VISITS WITH AN ANCILLARY PROCEDURE
(nanc)

*Key Technology PAC

PAC#	DESCRIPTION	ALL FACILITIES		HOSPITALS		D & T's	
		PRE	POST	PRE	POST	PRE	POST
10	Prenatal Revisit, Under 19/Over 34	(n=385) 51.9%	(n=2194) 51.1%	(n=282) 46.1%	(n=1033) 43.9%	(n=103) 68.0%	(n=1161) 57.5% *
11	Prenatal Revisit, 19 to 34	(n=706) 47.6%	(n=2265) 49.0%	(n=437) 38.7%	(n=1078) 41.2%	(n=269) 62.1%	(n=1187) 56.1% +
12	Annual Gynecological Exam	(n=360) 53.9%	(n=2191) 67.0%	(n=328) 51.2%	(n=1266) 55.1%	(n=32) 81.3%	(n=925) 83.1%
* 13	Diagnostic Investigation Reproductive	(n=182) 100.0%	(n=1754) 100.0%	(n=161) 100.0%	(n=906) 100.0%	(n=21) 100.0%	(n=848) 100.0%
14	Management Reproductive	(n=761) 53.5%	(n=2597) 49.4%	(n=515) 49.9%	(n=1405) 42.9% * *	(n=246) 61.0%	(n=1192) 57.1%
* 15	Diagnostic Investigation Reproductive	(n=327) 100.0%	(n=2366) 100.0%	(n=290) 100.0%	(n=1225) 100.0%	(n=37) 100.0%	(n=1141) 100.0%
16	Management Class 4	(n=915) 42.3%	(n=2585) 35.8% * *	(n=600) 40.2%	(n=1400) 31.1% * *	(n=315) 46.3%	(n=1185) 41.4%
* 17	Diagnostic Investigation Class 4	(n=219) 100.0%	(n=953) 100.0%	(n=219) 100.0%	(n=805) 100.0%	(n=0)	(n=0)
18	Management of Chemo- and Radio- Therapies	(n=202) 69.8%	(n=691) 71.6%	(n=202) 69.8%	(n=669) 74.0%	(n=0)	(n=0)
19	Management Class 4	(n=354) 41.5%	(n=2138) 38.2%	(n=339) 43.1%	(n=1200) 37.5% +	(n=15) 6.7%	(n=938) 39.0% * *

TABLE A.1

PERCENT OF VISITS WITH AN ANCILLARY PROCEDURE
(nanc)

*Key Technology PAC

PAC#	DESCRIPTION	ALL FACILITIES		HOSPITALS		D & T's	
		PRE	POST	PRE	POST	PRE	POST
20	Management Class 5	(n=374) 16.0%	(n=2393) 19.2%	(n=319) 17.0%	(n=1340) 21.6% *	(n=55) 10.9%	(n=1053) 16.0%
21	Audiological Testing	(n=136) 5.1%	(n=108) 29.7%	(n=134) 4.5%	(n=601) 32.4% . .	(n=2) 50.0%	(n=200) 21.5%
22	Ophthalmological Services	(n=412) 14.6%	(n=1188) 9.3%	(n=412) 14.6%	(n=998) 9.2% . .	(n=0)	(n=0)
23	Speech and Rehabilitation Therapies	(n=409) 4.9%	(n=995) 19.4% . .	(n=309) 4.2%	(n=795) 16.9% . .	(n=100) 7.0%	(n=200) 29.5%
* 24	CAT Scans and Nuclear Imaging	(n=164) 100.0%	(n=1155) 100.0%	(n=163) 100.0%	(n=855) 100.0%	(n=1) 100.0%	(n=300) 100.0%

_____)

PERCENT OF VISITS WITH A NON-KEY TECHNOLOGY PROCEDURE
(nnon)

Key Technology PAC

PAC#	DESCRIPTION	ALL FACILITIES		HOSPITALS		D & T's	
		PRE	POST	PRE	POST	PRE	POST
	ALL PACS	(n=10317) 2.1%	(n=47347) 3.2%	(n=8003) 1.8%	(n=26884) 3.7%	(n=2314) 3.1%	(n=20463) 2.6%
1	Well Care, 0-2	(n=652) 0.5%	(n=2587) 1.1%	(n=454) 0.2%	(n=1394) 1.4%	(n=198) 1.0%	(n=1193) 0.8%
2	Annual Well Care Exam 3-17	(n=779) 5.2%	(n=2543) 8.0%	(n=416) 2.9%	(n=1354) 6.1%	(n=63) 20.6%	(n=1189) 10.2%
3	Diagnostic Investigation Class 1, 0-17	(n=195) 0.5%	(n=1643) 2.9%	(n=183) 0.5%	(n=952) 2.9%	(n=12) 0.0%	(n=691) 2.9%
4	Management Class 1	(n=906) 1.0%	(n=2587) 1.7%	(n=599) 0.7%	(n=1394) 1.9%	(n=307) 1.6%	(n=1193) 1.5%
5	Medication Administration	(n=308) 0.0%	(n=2424) 1.0%	(n=293) 0.0%	(n=1391) 1.2%	(n=15) 0.0%	(n=1033) 0.8%
6	Annual Well Care Exam Over 17	(n=484) 1.9%	(n=2401) 3.0%	(n=351) 0.9%	(n=1318) 2.8%	(n=133) 4.5%	(n=1083) 3.1%
7	Diagnostic Investigation Class 2, Over 17	(n=385) 3.4%	(n=2470) 1.9%	(n=324) 3.3%	(n=1284) 1.9%	(n=61) 3.3%	(n=1186) 1.9%
8	Management Class 2, Over 17	(n=908) 2.1%	(n=2592) 1.6%	(n=599) 0.5%	(n=1401) 1.1%	(n=309) 5.2%	(n=1191) 2.2%
9	Initial Prenatal Evaluation	(n=94) 2.1%	(n=1834) 3.4%	(n=74) 0.0%	(n=830) 3.7%	(n=20) 10.0%	(n=1004) 3.2%

TABLE A.3

PERCENT OF VISITS WITH A NON-KEY TECHNOLOGY PROCEDURE
(nnon)

*Key Technology PAC

PAC#	DESCRIPTION	ALL FACILITIES		HOSPITALS		D & T's	
		PRE	POST	PRE	POST	PRE	POST
10	Prenatal Revisit, Under 19/Over 34	(n=385) 0.3%	(n=2194) 2.6% * *	(n=282) 0.0%	(n=1033) 4.5% * *	(n=103) 1.0%	(n=1161) 1.0%
11	Prenatal Revisit, 19 to 34	(n=706) 0.8%	(n=2265) 2.5% * *	(n=437) 0.2%	(n=1078) 2.9% * *	(n=269) 1.9%	(n=1187) 2.1%
12	Annual Gynecological Exam	(n=360) 0.0%	(n=2191) 0.6%	(n=328) 0.0%	(n=1266) 0.6% * *	(n=32) 0.0%	(n=925) 0.6% *
* 13	Diagnostic Investigation Reproductive	(n=182) 0.0%	(n=1754) 2.2%	(n=161) 0.0%	(n=906) 1.8% * *	(n=21) 0.0%	(n=848) 2.6% * *
14	Management Reproductive	(n=761) 2.9%	(n=2597) 2.2%	(n=515) 3.1%	(n=1405) 3.3%	(n=246) 2.4%	(n=1192) 0.8%
* 15	Diagnostic Investigation Reproductive	(n=327) 0.9%	(n=2366) 1.1%	(n=290) 1.0%	(n=1225) 1.3%	(n=37) 0.0%	(n=1141) 0.8% * *
16	Management Class 4	(n=915) 1.2%	(n=2585) 1.2%	(n=600) 0.8%	(n=1400) 1.2%	(n=315) 1.9%	(n=1185) 1.2%
* 17	Diagnostic Investigation Class 4	(n=219) 0.9%	(n=953) 2.6% * *	(n=219) 0.9%	(n=805) 2.7% *	(n=0)	(n=0)
18	Management of Chemo- and Radio- Therapies	(n=202) 8.9%	(n=691) 7.2%	(n=202) 8.9%	(n=669) 7.5%	(n=0)	(n=0)
19	Management Class 4	(n=354) 0.5%	(n=2138) 1.7% * *	(n=339) 0.6%	(n=1200) 2.2% *	(n=15) 0.0%	(n=938) 1.1% * *

TABLE A.3

PERCENT OF VISITS WITH A NON-KEY TECHNOLOGY PROCEDURE
(nnon)

*Key Technology PAC

<u>PAC#</u>	<u>DESCRIPTION</u>	<u>ALL FACILITIES</u>		<u>HOSPITALS</u>		<u>D & T's</u>	
		<u>PRE</u>	<u>POST</u>	<u>PRE</u>	<u>POST</u>	<u>PRE</u>	<u>POST</u>
20	Management Class 5	(n=374) 0.8%	(n=2393) 1.8% +	(n=319) 0.9%	(n=1340) 2.8% . *	(n=55) 0.0%	(n=1053) 0.6% .
21	Audiological Testing	(n=136) 3.7%	(n=108) 28.5% . .	(n=134) 3.0%	(n=601) 30.8% . .	(n=2) 50.0%	(n=200) 21.5%
22	Ophthalmological Services	(n=412) 11.2%	(n=1188) 7.0%	(n=412) 11.2%	(n=998) 6.4% . .	(n=0)	(n=0)
23	Speech and Rehabilitation Therapies	(n=409) 3.4%	(n=995) 18.0% . .	(n=309) 2.3%	(n=795) 15.7% . .	(n=100) 7.0%	(n=200) 27.0% . *
● 24	CAT Scans and Nuclear Imaging	(n=164) 0.6%	(n=1155) 1.6%	(n=163) 0.6%	(n=855) 1.9%	(n=1) 0.0%	(n=300) 0.7%

TABLE A.4

PERCENT OF VISITS WITH A KEY-TECHNOLOGY PROCEDURE
(ntec)

*Key Technology PAC

PAC#	DESCRIPTION	ALL FACILITIES		HOSPITALS		D & T's	
		PRE	POST	PRE	POST	PRE	POST
	ALL PACS	(n=10317) 15.8%	(n=47347) 24.2%	(n=8003) 18.1%	(n=26884) 24.2%	(n=2314) 7.7%	(n=20463) 24.1%
1	Well Care, 0-2	(n=652) 0.0%	(n=2587) 0.1%	(n=454) 0.0%	(n=1394) 0.0%	(n=198) 0.0%	(n=1193) 0.2%
2	Annual Well Care Exam 3-17	(n=779) 0.0%	(n=2543) 0.0%	(n=416) 0.0%	(n=1354) 0.0%	(n=63) 0.0%	(n=1189) 0.1%
* 3	Diagnostic Investigation Class 1, 0-17	(n=195) 100.0%	(n=1643) 100.0%	(n=183) 100.0%	(n=952) 100.0%	(n=12) 100.0%	(n=691) 100.0%
4	Management Class 1	(n=906) 0.0%	(n=2587) 0.0%	(n=599) 0.0%	(n=1394) 0.0%	(n=307) 0.0%	(n=1193) 0.0%
5	Medication Administration	(n=308) 0.0%	(n=2424) 0.0%	(n=293) 0.0%	(n=1391) 0.0%	(n=15) 0.0%	(n=1033) 0.0%
6	Annual Well Care Exam Over 17	(n=484) 4.3%	(n=2401) 5.5%	(n=351) 5.4%	(n=1318) 4.6%	(n=133) 1.5%	(n=1083) 6.6%
* 7	Diagnostic Investigation Class 2, Over 17	(n=385) 100.0%	(n=2470) 100.0%	(n=324) 100.0%	(n=1284) 100.0%	(n=61) 100.0%	(n=1186) 100.0%
8	Management Class 2, Over 17	(n=908) 0.1%	(n=2592) 0.2%	(n=599) 0.0%	(n=1401) 0.1%	(n=309) 0.3%	(n=1191) 0.3%
9	Initial Prenatal Evaluation	(n=94) 14.9%	(n=1834) 18.0%	(n=74) 14.9%	(n=830) 16.6%	(n=20) 15.0%	(n=1004) 19.2%

TABLE A.4

PERCENT OF VISITS WITH A KEY-TECHNOLOGY PROCEDURE
(ntec)

• Key Technology PAC

PAC#	DESCRIPTION	ALL FACILITIES		HOSPITALS		D & T's	
		PRE	POST	PRE	POST	PRE	POST
10	Prenatal Revisit, Under 19/Over 34	(n=385) 11.7%	(n=2194) 12.3%	(n=282) 11.3%	(n=1033) 12.6%	(n=103) 12.6%	(n=1161) 12.0%
11	Prenatal Revisit, 19 to 34	(n=706) 9.6%	(n=2265) 12.0% +	(n=437) 9.4%	(n=1078) 10.0%	(n=269) 10.0%	(n=1187) 13.9% +
12	Annual Gynecological Exam	(n=360) 1.1%	(n=2191) 3.7% * *	(n=328) 1.2%	(n=1266) 2.7% *	(n=32) 0.0%	(n=925) 5.2% * *
* 13	Diagnostic Investigation Reproductive	(n=182) 100.0%	(n=1754) 100.0%	(n=161) 100.0%	(n=906) 100.0%	(n=21) 100.0%	(n=848) 100.0%
14	Management Reproductive	(n=761) 0.0%	(n=2597) 0.0%	(n=515) 0.0%	(n=1405) 0.0%	(n=246) 0.0%	(n=1192) 0.1%
* 15	Diagnostic Investigation Reproductive	(n=327) 100.0%	(n=2366) 100.0%	(n=290) 100.0%	(n=1225) 100.0%	(n=37) 100.0%	(n=1141) 100.0%
16	Management Class 4	(n=915) 0.0%	(n=2585) 0.1%	(n=600) 0.0%	(n=1400) 0.0%	(n=315) 0.0%	(n=1185) 0.2%
* 17	Diagnostic Investigation Class 4	(n=219) 100.0%	(n=953) 100.0%	(n=219) 100.0%	(n=805) 100.0%	(n=0)	(n=0)
18	Management of Chemo- and Radio- Therapies	(n=202) 0.0%	(n=691) 0.0%	(n=202) 0.0%	(n=669) 0.0%	(n=0)	(n=0)
19	Management Class 4	(n=354) 0.0%	(n=2138) 0.0%	(n=339) 0.0%	(n=1200) 0.0%	(n=15) 0.0%	(n=938) 0.1%

TABLE A.4

**PERCENT OF VISITS WITH A KEY-TECHNOLOGY PROCEDURE
(ntec)**

*Key Technology PAC

PAC#	DESCRIPTION	ALL FACILITIES		HOSPITALS		D & T's	
		PRE	POST	PRE	POST	PRE	POST
20	Management Class 5	(n=374) 0.0%	(n=2393) 0.0%	(n=319) 0.0%	(n=1340) 0.0%	(n=55) 0.0%	(n=1053) 0.0%
21	Audiological Testing	(n=136) 0.0%	(n=108) 0.1%	(n=134) 0.0%	(n=601) 0.2%	(n=2) 0.0%	(n=200) 0.0%
22	Ophthalmological Services	(n=412) 0.7%	(n=1188) 0.5%	(n=412) 0.7%	(n=998) 0.6%	(n=0) 0.0%	(n=0) 0.0%
23	Speech and Rehabilitation Therapies	(n=409) 0.0%	(n=995) 0.0%	(n=309) 0.0%	(n=795) 0.0%	(n=100) 0.0%	(n=200) 0.0%
* 24	CAT Scans and Nuclear Imaging	(n=164) 100.0%	(n=1155) 100.0%	(n=163) 100.0%	(n=855) 100.0%	(n=1) 100.0%	(n=300) 100.0%

TABLE A.2

PERCENT OF VISITS WITH A LABORATORY PROCEDURE
(nlab)

*Key Technology PAC

PAC#	DESCRIPTION	ALL FACILITIES		HOSPITALS		D & T's	
		PRE	POST	PRE	POST	PRE	POST
	ALL PACS	(n=10317) 35.8%	(n=47347) 36.2%	(n=8003) 34.4%	(n=26884) 32.1%	(n=2314) 40.6%	(n=20463) 41.7%
1	Well Care, 0-2	(n=652) 26.7%	(n=2587) 25.5%	(n=454) 21.6%	(n=1394) 20.2%	(n=198) 38.4%	(n=1193) 31.7% +
2	Annual Well Care Exam 3-17	(n=479) 43.2%	(n=2543) 41.7%	(n=416) 39.2%	(n=1354) 32.0%	(n=63) 69.8%	(n=1189) 52.8%
3	Diagnostic Investigation Class 1, 0-17	(n=195) 24.6%	(n=1643) 22.6%	(n=183) 24.6%	(n=952) 17.9%	(n=12) 25.0%	(n=691) 29.2%
4	Management Class 1	(n=906) 25.7%	(n=2587) 16.1%	(n=599) 29.5%	(n=1394) 14.2%	(n=307) 18.2%	(n=1193) 18.4%
5	Medication Administration	(n=308) 27.3%	(n=2424) 17.2%	(n=293) 28.0%	(n=1391) 13.7%	(n=15) 13.3%	(n=1033) 22.0%
6	Annual Well Care Exam Over 17	(n=484) 51.7%	(n=2401) 49.6%	(n=351) 53.3%	(n=1318) 47.6%	(n=133) 47.4%	(n=1083) 52.1%
7	Diagnostic Investigation Class 2, Over 17	(n=385) 30.0%	(n=2470) 32.0%	(n=324) 29.0%	(n=1284) 29.7%	(n=61) 36.1%	(n=1186) 35.0%
8	Management Class 2, Over 17	(n=908) 23.0%	(n=2592) 21.3%	(n=599) 20.7%	(n=1401) 19.3%	(n=309) 27.5%	(n=1191) 23.6%
9	Initial Prenatal Evaluation	(n=94) 74.5%	(n=1834) 69.5%	(n=74) 74.3%	(n=830) 75.7%	(n=20) 75.0%	(n=1004) 64.4%

TABLE A.2

PERCENT OF VISITS WITH A LABORATORY PROCEDURE
(nlab)

*Key Technology PAC

PAC#	DESCRIPTION	ALL FACILITIES		HOSPITALS		D & T's	
		PRE	POST	PRE	POST	PRE	POST
10	Prenatal Revisit, Under 19/Over 34	(n=385) 46.0%	(n=2194) 42.2%	(n=282) 40.1%	(n=1033) 34.1% +	(n=103) 62.1%	(n=1161) 49.4% .
11	Prenatal Revisit, 19 to 34	(n=706) 41.4%	(n=2265) 40.0%	(n=437) 32.7%	(n=1078) 32.9%	(n=269) 55.4%	(n=1187) 46.5% .
12	Annual Gynecological Exam	(n=360) 53.6%	(n=2191) 66.3% . .	(n=328) 50.9%	(n=1266) 54.2%	(n=32) 81.3%	(n=925) 82.9%
* 13	Diagnostic Investigation Reproductive	(n=182) 73.6%	(n=1754) 61.7% . .	(n=161) 73.3%	(n=906) 58.7% . .	(n=21) 76.2%	(n=848) 65.0%
14	Management Reproductive	(n=761) 53.5%	(n=2597) 49.4% .	(n=515) 47.6%	(n=1405) 41.2% *	(n=246) 60.2%	(n=1192) 56.8%
● 15	Diagnostic Investigation Reproductive	(n=327) 56.2%	(n=2366) 46.8% . .	(n=290) 56.6%	(n=1225) 44.7% . .	(n=37) 54.1%	(n=1141) 49.1%
16	Management Class 4	(n=915) 42.3%	(n=2585) 35.8% . .	(n=600) 39.5%	(n=1400) 30.5% . *	(n=315) 45.7%	(n=1185) 40.9%
* 17	Diagnostic Investigation Class 4	(n=219) 68.5%	(n=953) 64.2%	(n=219) 68.5%	(n=805) 65.2%	(n=0)	(n=0)
18	Management of Chemo- and Radio- Therapies	(n=202) 36.1%	(n=691) 40.8%	(n=202) 36.1%	(n=669) 42.2%	(n=0)	(n=0)
19	Management Class 4	(n=354) 41.2%	(n=2138) 37.7%	(n=339) 42.8%	(n=1200) 36.6% *	(n=15) 6.7%	(n=938) 39.0% *

TABLE A.2

PERCENT OF VISITS WITH A LABORATORY PROCEDURE
(nlab)

*Key Technology PAC

PAC#	DESCRIPTION	ALL FACILITIES		HOSPITALS		D & T's	
		PRE	POST	PRE	POST	PRE	POST
20	Management Class 5	(n=374) 15.8%	(n=2393) 18.2%	(n=319) 16.6%	(n=1340) 20.1%	(n=55) 10.9%	(n=1053) 15.7%
21	Audiological Testing	(n=136) 1.5%	(n=108) 1.2%	(n=134) 1.4%	(n=601) 1.6%	(n=2) 0.0%	(n=200) 0.0%
22	Ophthalmological Services	(n=412) 3.6%	(n=1188) 2.0%	(n=412) 3.6%	(n=998) 2.4%	(n=0) 0.0%	(n=0) 0.0%
23	Speech and Rehabilitation Therapies	(n=409) 1.5%	(n=995) 3.0% +	(n=309) 1.9%	(n=795) 1.4%	(n=100) 0.0%	(n=200) 9.5% *
* 24	CAT Scans and Nuclear Imaging	(n=164) 61.6%	(n=1155) 49.0% . .	(n=163) 62.0%	(n=855) 47.0% * .	(n=1) 0.0%	(n=300) 54.7%

Table A.5
Percent of Visits by Primary Provider

Key Technology PAC	ALL FACILITIES			HOSPITAL			D&Ts		
	Pre (n=10317)	Post (n=47347)		Pre (n=8003)	Post (n=26884)		Pre (n=2314)	Post (n=20463)	
All PACS									
Primary Care MD	62.5%	71.3%	**	66.0%	76.0%	**	50.2%	65.2%	**
Specialist MD	19.7%	9.1%	**	20.2%	9.4%	**	17.9%	8.7%	**
Non-MD	17.9%	19.6%	**	13.8%	14.6%	+	31.9%	26.1%	**
PAC 1: Well Care, O-2									
Primary Care MD	62.7%	77.7%	**	71.8%	80.1%	**	41.9%	74.9%	**
Specialist MD	27.9%	11.2%	**	18.1%	8.2%	**	50.5%	14.7%	**
Non-MD	9.4%	11.1%		10.1%	11.7%		7.6%	10.4%	
PAC 2: Annual Well Care Exam, 3-17									
Primary Care MD	64.9%	76.4%	**	67.5%	80.1%	**	47.6%	72.2%	**
Specialist MD	26.1%	10.2%	**	23.8%	6.8%	**	41.3%	14.1%	**
Non-MD	9.0%	13.4%	**	8.7%	13.1%	*	11.1%	13.7%	
* PAC 3: Diagnostic Investigation Class I, O-17									
Primary Care MD	74.9%	78.6%		74.3%	82.6%	*	83.3%	73.2%	
Specialist MD	22.1%	11.9%	**	23.5%	13.6%	**	0.0%	9.6%	**
Non-MD	3.1%	9.5%	**	2.2%	3.9%		16.7%	17.2%	
PAC 4: Management Class 1									
Primary Care MD	70.6%	76.4%	**	78.6%	80.9%		55.0%	71.1%	**
Specialist MD	19.9%	11.1%	**	13.5%	8.4%	**	32.2%	14.2%	**
Non-MD	9.5%	12.5%	**	7.8%	10.7%	*	12.7%	14.7%	

Table A.5
Percent of Visits by Primary Provider

Key Technology PAC	ALL FACILITIES			HOSPITAL			D&Ts		
	Pre	Post		Pre	Post		Pre	Post	
PAC 5: Medication Administration	(n=308)	(n=2424)		(n=293)	(n=1391)		(n=15)	(n=1033)	
Primary Care MD	61.7%	58.7%		61.8%	62.4%		60.0%	53.7%	
Specialist MD	15.6%	5.0%	**	15.7%	4.7%	**	13.3%	5.4%	
Non-MD	22.7%	36.3%	**	22.5%	32.9%	**	26.7%	40.9%	
PAC 6: Annual Well Care Exam, Over 17	(n=484)	(n=2401)		(n=351)	(n=1318)		(n=133)	(n=1083)	
Primary Care MD	84.1%	76.6%	**	85.8%	90.4%	*	79.7%	59.9%	**
Specialist MD	2.9%	3.0%		1.7%	1.0%		6.0%	5.4%	
Non-MD	13.0%	20.4%	**	12.5%	8.6%	*	14.3%	34.6%	**
* PAC 7: Diagnostic Investigation Class 2, Over 17	(n=385)	(n=2470)		(n=324)	(n=1284)		(n=61)	(n=1186)	
Primary Care MD	67.8%	77.4%	**	65.7%	85.2%	**	78.7%	69.0%	+
Specialist MD	18.7%	6.6%	**	22.2%	7.6%	**	0.0%	5.6%	**
Non-MD	13.5%	16.0%		12.0%	7.2%	*	21.3%	25.5%	
PAC 8: Management Class 2, Over 17	(n=908)	(n=2592)		(n=599)	(n=1401)		(n=309)	(n=1191)	
Primary Care MD	68.9%	75.8%	**	76.5%	84.3%	**	54.4%	65.7%	**
Specialist MD	9.4%	6.2%	**	11.7%	6.9%	**	4.9%	5.3%	
Non-MD	21.7%	18.1%	*	11.9%	8.8%	*	40.8%	29.0%	**
PAC 9: Initial Prenatal Evaluation	(n=94)	(n=1834)		(n=74)	(n=830)		(n=20)	(n=1004)	
Primary Care MD	62.8%	70.7%		67.6%	74.2%		45.0%	67.7%	+
Specialist MD	33.0%	5.3%	**	31.1%	2.1%	**	40.0%	8.0%	*
Non-MD	4.3%	24.0%	**	1.4%	23.7%	**	15.0%	24.3%	

Table A.5
Percent of Visits by Primary Provider

Key Technology PAC	ALL FACILITIES			HOSPITAL			D&Ts		
	Pre	Post		Pre	Post		Pre	Post	
PAC 10: Prenatal Revisit, Under 19/Over 34	(n=385)	(n=2194)		(n=282)	(n=1033)		(n=103)	(n=1161)	
Primary Care MD	50.9%	73.4%	**	55.7%	76.4%	**	37.9%	70.7%	**
Specialist MD	26.2%	8.8%	**	23.4%	6.2%	**	34.0%	11.2%	**
Non-MD	22.9%	17.8%	*	20.9%	17.4%		28.2%	18.1%	*
PAC 11: Prenatal Revisit, 19 to 34	(n=706)	(n=2265)		(n=437)	(n=1078)		(n=269)	(n=1187)	
Primary Care MD	59.1%	77.4%	**	72.3%	84.5%	**	37.5%	71.0%	**
Specialist MD	20.3%	8.8%	**	17.2%	6.4%	**	25.3%	11.0%	**
Non-MD	20.7%	13.7%	**	10.5%	9.1%		37.2%	17.9%	**
PAC 12: Annual Gynecological Exam	(n=360)	(n=2191)		(n=328)	(n=1266)		(n=32)	(n=925)	
Primary Care MD	66.1%	73.2%	**	65.9%	84.6%	**	68.8%	57.5%	
Specialist MD	17.2%	4.5%	**	18.3%	3.5%	**	6.3%	5.9%	
Non-MD	16.7%	22.3%	**	15.9%	11.9%	+	25.0%	36.5%	
* PAC 13: Diagnostic Investigation Reproductive	(n=182)	(n=1754)		(n=161)	(n=906)		(n=21)	(n=848)	
Primary Care MD	75.8%	71.8%		79.5%	82.2%		47.6%	60.6%	
Specialist MD	4.4%	10.5%	**	3.7%	10.6%	**	9.5%	10.4%	
Non-MD	19.8%	17.7%		16.8%	7.2%	**	42.9%	29.0%	
PAC 14: Management Reproductive	(n=761)	(n=2597)		(n=515)	(n=1405)		(n=246)	(n=1192)	
Primary Care MD	55.1%	72.7%	**	66.2%	82.3%	**	31.7%	61.4%	**
Specialist MD	15.2%	5.8%	**	15.9%	5.7%	**	13.8%	6.0%	**
Non-MD	29.7%	21.4%	**	17.9%	12.0%	**	54.5%	32.6%	**

Table A.5
Percent of Visits by Primary Provider

Key Technology PAC	ALL FACILITIES			HOSPITAL			D&Ts		
	Pre	Post		Pre	Post		Pre	Post	
* PAC 15: Diagnostic Investigation Class 3	(n=327)	(n=2366)		(n=290)	(n=1225)		(n=37)	(n=1141)	
Primary Care MD	72.5%	82.1%	**	72.4%	89.4%	**	73.0%	74.2%	
Specialist MD	11.3%	5.7%	**	72.8%	4.8%	**	0.0%	6.7%	**
Non-MD	16.2%	12.2%	+	14.8%	5.8%	**	27.0%	19.1%	
PAC 16: Management Class 3	(n=915)	(n=2585)		(n=600)	(n=1400)		(n=315)	(n=1185)	
Primary Care MD	74.8%	80.5%	**	78.0%	86.9%	**	68.6%	72.8%	
Specialist MD	8.1%	5.4%	**	9.8%	5.5%	**	4.8%	5.3%	
Non-MD	17.2%	14.1%	*	12.2%	7.6%	**	26.7%	21.9%	+
* PAC 17: Diagnostic Investigation Class	(n=219)	(n=953)		(n=219)	(n=805)		(n=0)	(n=0)	
Primary Care MD	51.1%	67.4%	**	51.4%	65.5%	**			
Specialist MD	47.5%	26.7%	**	47.5%	31.3%	**			
Non-MD	1.4%	6.0%	**	1.4%	3.2%	+			
PAC 18: Management of Chemo- and Radio-Therapies	(n=202)	(n=691)		(n=202)	(n=669)		(n=0)	(n=0)	
Primary Care MD	43.6%	56.7%	**	43.6%	56.7%	**			
Specialist MD	45.5%	10.0%	**	45.5%	10.3%	**			
Non-MD	10.9%	33.3%	**	10.9%	33.0%	**			
PAC 19: Management Class 4	(n=354)	(n=2138)		(n=339)	(n=1200)		(n=15)	(n=938)	
Primary Care MD	54.2%	72.3%	**	52.2%	71.2%	**	100.0%	73.8%	**
Specialist MD	42.7%	16.6%	**	44.5%	22.3%	**	0.0%	9.2%	**
Non-MD	3.1%	11.1%	**	3.2%	6.5%	**	0.0%	17.1%	**

Table A.5
Percent of Visits by Primary Provider

Key Technology PAC	ALL FACILITIES			HOSPITAL			D&Ts		
	Pre		Post	Pre		Post	Pre		Post
PAC 20: Management Class 5	(n=374)		(n=2393)	(n=319)		(n=1340)	(n=55)		(n=1053)
Primary Care MD	62.8%		68.2% *	67.4%		83.4% **	36.4%		48.7% +
Specialist MD	16.6%		3.1% **	18.8%		4.4% **	1.8%		1.4%
Non-MD	20.9%		28.8% **	13.8%		12.2%	61.8%		49.9% +
PAC 21: Audiological Testing	(n=0)		(n=0)	(n=134)		(n=601)	(n=2)		(n=200)
Primary Care MD				0.0%		0.0%	0.0%		0.0%
Specialist MD				0.0%		0.0%	0.0%		0.0%
Non-MD				100.0%		100.0%	100.0%		100.0%
PAC 22: Ophthalmological Services	(n=412)		(n=1188)	(n=412)		(n=988)	(n=0)		(n=0)
Primary Care MD	44.7%		53.2% **	44.7%		64.0% **			
Specialist MD	51.2%		41.2% **	51.2%		33.1% **			
Non-MD	4.1%		5.6%	4.1%		2.9%			
PAC 23: Speech and Rehabilitation Therapies	(n=409)		(n=995)	(n=309)		(n=795)	(n=100)		(n=200)
Primary Care MD	32.0%		27.9%	42.4%		35.0% *	0.0%		0.0%
Specialist MD	14.2%		9.3% *	18.8%		11.4% **	0.0%		1.0%
Non-MD	53.8%		62.7% **	38.8%		53.6% **	100.0%		99.0%
* PAC 24: CAT Scans and Nuclear imaging	(n=164)		(n=1155)	(n=163)		(n=855)	(n=1)		(n=300)
Primary Care MD	75.0%		74.3%	74.8%		70.4%	100.0%		85.3%
Specialist MD	19.5%		19.4%	19.6%		25.6% +	0.0%		1.7%
Non-MD	5.5%		6.3%	5.5%		4.0%	0.0%		13.0%

APPENDIX 3

WORKING PAPER:



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**APPLYING PACs TO MEDICARE:
FINAL REPORT**

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EXECUTIVE SUMMARY

While much of the attention on developing a Medicare payment system for hospital outpatient departments has centered on surgeries, many other services are also performed in that setting. One natural place to look for an alternative payment system is the products of Ambulatory Care (PAC) system developed by the State of New York for reimbursing outpatient (nonsurgical) clinic visits by their Medicaid patients. Since this system has not only been developed, but is being used in practice, it may serve as a basis for such a payment system under Medicare, or at least offer important lessons in the development process.

This project explores the applicability of the PAC system to Medicare and is part of a larger project evaluating how the PAC system works in practice in New York. That larger project will examine some of the gaming and practicality issues facing the system. This paper explores what adjustments would be needed in Medicare data, how well the system would do at classifying services into the PAC categories, what that distribution would look like and how it would vary across different types of hospitals in various locations.

How PACs work

The PAC system was designed to bundle related medical services typically received by patients in hospital outpatient departments and freestanding clinics using a clinically meaningful yet administratively simple classification system. A single payment is then made for all services associated with a particular visit including physician fees, facility fees and ancillary services (including those that may occur on a later day but were ordered during the original visit). In New York, facilities receive a fixed

payment consisting of two components: an amount reflecting the average labor and ancillary costs for the PAC and a facility-specific payment.

The visits are categorized into one of 24 PAC reimbursement groups as defined by diagnosis, patient characteristics, and level of **services** received. The patient characteristics and the diagnosis result in different "classes" of **PACs**. Within each class there can be several types of services, the most important of which are diagnostic and management. The diagnostic service categories include those visits where one or more "key technologies" are used. These key technologies signal a higher intensity of visit than the management **PACs** that consist of the simple physician and perhaps some simple lab tests.' In New York, only-about 20 percent of all visits are classified as "diagnostic."

Special software are used to calculate these groupings and the data provided by participating clinics and outpatient departments in New York are specifically designed for the system software. Only qualifying visits are put into' the software; The two main areas outside the PAC system are surgical visits and ancillary visits only where patients are referred to the facility by doctors in the community.

Adapting **Medicare** Data

Since Medicare data were not designed for use with the software, a number of adjustments were necessary. With only a couple of exceptions, all the information necessary to run the software was available from Medicare data. The chief assumption that **had** to be made concerned whether the visit was a new visit. These missing data only affected a few cases, however.

The biggest challenge was to combine the facility visit information with the physician bill data which are two separate data systems under Medicare.

Fortunately, these data were being combined as part of another project, requiring only some additional editing for this study. For this analysis, we used a merged file that appended the BMAD beneficiary files to the hospital outpatient file for 1987. This initial file contained 1,235,094 claims.

To ready the data for use with PACs we had to first eliminate surgical claims from the file. We did so by running another New York state program, the Products of Ambulatory Surgery (PAS), on the data. All claims that were grouped into the PAS were then eliminated from our working file-126,976 claims were eliminated in this way. On these nonsurgical claims we then applied the PAC grouper. All but 749 claims grouped into the 24 categories. That meant that our file contained 1,107,369 files that could be grouped.

One last step was needed, however. we still had to eliminate those claims that reflected referred ancillary services where there was no related clinic visit. For the Medicare data, that cut the number of relevant claims almost in half-to 549,690. The extent of referred ancillaries in the Medicare data reflects an important finding; many of the Medicare claims would need to be handled by a different system, perhaps a fixed fee for radiology and lab tests as is done in New York.

Finally, we trimmed the data set to eliminate claims that appeared to be erroneous. After eliminating those claims with zero charges, we eliminated claims above and below 2.5 standard deviations using a lognormal distribution. In addition, we deleted End Stage Renal Disease claims since they often reflect multiple visits. The final working file thus consisted of 500,611 claims.

What PACs Look Like

The PAC grouper uniquely assigns these claims into the categories, although only 21 of the PACs have cases assigned. And several others have only

a handful of cases. All the PACs pertaining to children under the age of 18 disappear when ESRD claims are eliminated. The other irrelevant groups are the well-care categories (such as annual gynecological exam) since Medicare does not cover such services. The top 10 PACs account for 97 percent of the visits.

Perhaps even more important, Medicare claims are much more likely to group into the diagnostic PACs than has been the experience in New York. Over 42 percent of the Medicare claims are in diagnostic categories.

Evaluation Criteria

The major criteria for judging the PAC system's applicability to Medicare include the extent to which it explains variations in resource use, the appropriateness of the system to Medicare, the administrative complexity of the system, the stability of the system and provider incentives. This analysis focused mainly on the first of these criteria. We also discuss appropriateness and administrative complexity. The last two are more the province of the larger study, although some discussion is provided in this analysis as well where relevant.

In addition, this analysis examines the impact on various hospitals of a simple version of a PAC system using average allowed charges within each PAC.

Findings

Appropriateness. This criterion refers to the degree to which the classifications are meaningful to the Medicare population. The PAC system does a good job of categorizing Medicare services (once surgery claims and ancillary claims have been excluded). No patient types or visit types are systematically excluded and claims group correctly according to the system's logic. Not all the groups are useful, however. Indeed, as noted above, our findings indicate that 10 PAC groups account for more than 97 percent of all the claims.

Administrative Simplicity. The PAC system is a relatively straightforward, **easily understandable** approach to the classification of outpatient medical services. The system collapses over 5,000 ICD-9 codes into (for Medicare purposes) 19 groups. However, it does incorporate some concepts which would be new to the Medicare program and would thus require administrative changes. The first of these is the bundled payment for the facility and physician components. Currently, Medicare reimburses for technical and professional services under **separate reimbursement** systems using totally different billing systems. Thus, a bundled payment would require substantial administrative changes for both program administrators and providers. Also, the bundling of ancillaries with related visits would require outpatient departments to make administrative changes in their current billing practices. **HCFA** would also need to enforce the bundled bill requirement. Finally, in order to correctly categorize Medicare claims into PAC groups, additional data elements **would need** to be added to the outpatient bills. While it is possible to manipulate existing data elements to categorize Medicare claims into PAC groups, more direct measures of the necessary data elements would be required if the system were to be implemented accurately.

Reductions in Variance. The primary purpose of a classification system is to categorize cases so that variation within groups is minimized and variation across groups is maximized. If these objectives are met, the system as a whole should maximize the explained variance in resource use. These objectives can be empirically measured by examining the cost coefficients of variation for the individual groups and the overall explained variance attributable to the PAC system (R^2). Using this approach, the coefficients of variation (CV) range from **0.51** to 1.28. Seven of the nineteen PACs have CVs in

excess of 1. Among the four largest **PAC** groups (**PACs** 7,8,15,16) the **CVs** range from 0.70 to 1.06. Thus, some refinement of selected **PACs** might be necessary.

The overall level of explained variance achieved by the model appears to be within the range of 'reasonable expectations. The **PAC** system was found to explain roughly 24 percent of observed variation in outpatient costs. We can consider **ICD-9** diagnosis codes and major diagnosis/service categories to be the basic building blocks of a medical classification system. The **PAC** system was found to outperform these classification systems. By going beyond the clinically meaningful **ICD-g**-based classifications to explicitly identify resource use through a diagnostic/management group splitting, the **PACs** achieve greater explanatory power.

Stability and Provider Incentives., The relative stability of a system is dependent upon the ease with which new technologies or practice patterns can be incorporated into the- system, as well as the relative "gameability" of the system. The **PAC** system, with its broad groupings, should easily adapt to changes in technology or practice patterns. The "gameability" of the system refers mainly to the ability of a provider to move across groups for the sole purpose of increasing payment. Since each **PAC** group is defined by relatively broad body system categories, and the number of **PAC** groups is small, the ability to move across **PACs** by patient class (i.e., from the class II **PAC** to the class IV **PAC**) is limited. However, within these patient class groups it is relatively easy to move from a management **PAC** to a diagnostic **PAC** simply by providing one of the key technology procedures. The rate structure must then be carefully set so that providers do not have an incentive to provide unnecessary ancillary services in order to change a **PAC** group assignment. In addition, the requirement that all ancillary services related to a visit must be bundled into the **PAC** claim should be strictly enforced so that providers do

not game the system by billing for a visit under PAC reimbursement and billing for related ancillaries under a fee schedule. In this regard, the relationship between ancillary service fee schedules (assuming that fee schedules will be used to pay for ancillary only claims) and PAC payment rates should be explored so that financial incentives for system gaming are not put in place.

Distributional Impacts on Hospitals. In general the distribution of PAC groupings vary little across different types of hospitals and across different regions or size of metropolitan area. When examined in terms of payments, however, considerable variation occurs. We assumed a PAC payment based on the national average of the "combined payment" amount for services in each PAC. "Combined payment" is defined as the sum of the allowed charge for BMAD services (physician and ancillary services) plus the facility payment (derived from applying the cost-to-charge ratio for the facility to the reported charges). Actual payments reflect differences in regional and urban/rural reimbursement levels, while the PAC calculation is done at the national level for simplicity. Thus, results indicating variations in what would be paid under PACs as compared to the actual payments by location of the hospital may be viewed as the level of adjustments that might be necessary to a national rate. Other variations reflect cost differences and fee level variations that would not be allowed under a PAC system without other adjustments. There would be some major winners and losers under this system. As expected, bed size of the hospital is important, although less so when size of the metropolitan area is taken into account. Sole community, rural referral and disproportionate share hospitals all would gain.

I. INTRODUCTION

Hospital outpatient departments remain one of the few areas not yet subjected to major payment reform under the Medicare system. Such reform has changed Medicare's relationship with hospitals for inpatient care by moving to a prospective rather than cost-based, reimbursement approach. The newly passed physician fee schedules, while reducing payments for procedures and raising fees for cognitive services, will likely have a major influence on physicians when those reforms are implemented in **1992**. Despite these other reforms that move away from cost-based systems, Medicare still relies on cost-based reimbursement for non-surgical services provided in hospital outpatient departments. But that too will likely change. In the **1990** budget agreement, the Congress mandated that the Health Care Financing Administration, which oversees Medicare, examine new payment mechanisms for outpatient services.

Cost-based reimbursement systems are generally thought to discourage efficient delivery of care since providers can simply pass on the costs of unnecessary services or inefficient procedures to Medicare for payment. Mechanisms that encourage providers to carefully assess the efficacy of their activities can help hold down costs over time. Moreover, a simpler payment mechanism that reimburses providers in a more even-handed way is likely to be a fairer system as well, or at least perceived as fairer. Finally, leaving outpatient payment unchanged while providers of other types of care face new incentives means that undesirable shifting across sites of care might occur. There has traditionally been concern that payment reform of inpatient services may have helped shift care into the outpatient setting. Similarly, shifts might occur between outpatient departments and physicians' offices. if the

methods of payment used create incentives to inappropriately alter patterns of care only to improve reimbursement.

One natural place to look for an alternative outpatient payment system is the Products of Ambulatory Care (**PAC**) system developed by the State of New York for reimbursing outpatient visits by their Medicaid patients. Since this system has not only been developed, but is being used in practice, it may serve as a basis for such a payment system under Medicare, or at least offer important lessons in the development process.

This project considers the applicability of the PAC system to Medicare and is part of a larger evaluation.¹ This analysis was designed to determine whether the **PAC** software could be run on Medicare data, and what the implications of such a system would be for Medicare. Specifically, we addressed several issues:

- Is the New York system transferable to Medicare or are there significant impediments to Medicare transferability because of:
 - a. differences between New York State and the rest of the country with regard to delivery of ambulatory care, service patterns, etc., or
 - b. differences between the New York State population and the Medicare population?
- How effective is the system in categorizing outpatient visits (e.g. claims that do or do not group) and in explaining cost variation?
- If applied to a national sample of hospital outpatient departments, what would be the impact of a PAC system on reimbursements?

1. For a description of the project as a whole, see Lois Olinger, "Evaluation of the New York State PAC Project: Case Study of PACs Implementation," report submitted to the Health Care Finance Administration, Abt. Associates Inc., November, 1990.

Our analysis is complicated by the necessity of using Medicare data that have not been designed for this type of a payment system. Sorting out whether, findings represent problems with the PAC system itself or with using Medicare administrative data as currently structured poses a formidable task.

This paper presents these final results. The introductory section briefly describes the PAC system and how it was developed in New York. Also in this section, we summarize the findings of an earlier paper on how New York's outpatient system differs from the rest of the U.S. That paper specifically addressed one of the issues about transferring a New York system to the rest of the country. This section concludes with a further discussion of the issues raised for the **applicability** of such a system for Medicare.

In section II, we discuss technical adjustments necessary to apply the PAC system to Medicare data. The data we use come from Medicare's administrative records which reflect the current payment structure. This differs substantially from the data that New York imports into its PAC system which are **specifically tailored** to the elements required to classify claims for payment. In this section we address most of the data compatibility issues.

Finally, Section III presents the results of our analysis. We provide data on the distribution of **PACs** that results from our Medicare analysis and examine how the distribution varies by location and hospital characteristics. We then simulate the impact of a budget neutral payment system on hospitals to test how well it explains cost variation and how hospitals of various characteristics would fare as compared to current levels of payment.

THE PAC SYSTEM

The State of New York developed the PAC system to serve as an administratively simple yet clinically meaningful classification system to reimburse outpatient departments and freestanding clinics under their Medicaid **program**.² This payment system was designed to serve patients of all ages and to replace Medicaid payments that had been held to a very low level for some time.

The PAC system bundles related medical services typically received by patients in these clinics and then a single payment is made for physician services, ancillary services and facility fees associated with a patient's visit to the facility. This is an important departure from the way that facilities and patients are reimbursed; traditionally, physicians would bill separately from the facility for outpatient **services**.³ The visit package may also cover ancillary services provided on a later day if they were ordered during the original physician visit. This "bundled" set of services thus attempts to be all inclusive for activity surrounding a clinic visit to a physician. These packages are combined into 24 PAC reimbursement groups as defined by diagnosis, patient characteristics, and level of services received. The prospective payment for care thus is one of 24 possible payment amounts.

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2. A more detailed description of the PAC system can be found in Paul **Tenan** et al., "**PACs**: Classifying Ambulatory Care Patients and Services for Clinical and Financial Management," Journal of Ambulatory Care Management, Vol 11, 1988, pp. 36-53. Much of the discussion in this section is drawn from this article.
 3. Normally, under Medicare, two separate and largely uncoordinated payment structures are used that **distinguish** between the outpatient **facility** and the physician's charges. In a **few** places, there are all inclusive **rate** providers where the two are combined. The majority of such providers are in New York.

Facilities receive a fixed, prospective payment comprised of two components—a casemix related direct price which reflects the average cost of labor, ancillary services and supplies within a given PAC, and a facility-specific add-on which reflects individual facility costs including operational, teaching, pharmacy, and capital costs.⁴ The direct price component is the same for all facilities, and the term “casemix” refers to the way in which that standardized price was set. The labor component of this direct price was derived from per-minute charges for patient time by various levels of staff. The ancillary service component represents a standardized average of the costs of the ancillary services provided in each PAC. The facility-specific add-on uses historical costs subject to certain limits. It is the same for each PAC. Each component accounts for about 50 percent of the payment.⁵ There is no outlier adjustment.

Data for the system development came from a sample of **10,000** ambulatory records from Bronx county and New York state’s northeast region. The sample explicitly excluded ambulatory surgery (covered under a separate reimbursement system), dental, mental health, and renal dialysis clinics and emergency rooms. The sample included persons of all ages and included both hospital outpatient clinics and freestanding ambulatory clinics (community health centers). It was not limited to Medicaid program recipients in this developmental stage. After reviewing other efforts to cluster ambulatory care services, a number of models and groupings were analyzed. The goal was to put together groups of visits

4. This payment methodology is described in more detail in Olinger et al., op cit.

5. Tenan et al., op cit.

with similar resource use. What emerged was a multidimensional classification system using patient characteristics-including diagnosis-and service use.⁶

The matrix of groupings is shown in Figure 1. The patient characteristics refer to age and diagnosis classification using ICD-9 CM. These differences are indicated as "classes", resulting in groupings by body system diagnoses. In some instances these classes are further differentiated by age (usually separating children from adults). A definition of these classes is shown in Figure 2. Several classes include many different body systems. Systems were combined into one group when they demonstrated similar resource use.

The columns of the matrix in Figure 1 refer to types of services--diagnostic, management, therapies and well care. Again, these groupings are intended to identify different levels of service use. The diagnostic and management categories are the most common and distinguished by the presence of "key technologies" in the visit. If a key technology (defined specifically in the software and including, for example, x-rays, ultrasound, stress tests, nuclear imaging and CAT scans) is used, the visit is termed diagnostic under the assumption that these patients present uncertainty to the provider who must devote considerable resources to treat the patient. It is assumed that not only are key technologies used, but also other tests as well. The key technologies thus serve as indicators of greater resource use overall. Other patients who do not receive these key technologies are assigned to the management category and should require fewer resources to treat.

The PAC system has been in operation in New York since 1987 as a payment system for Medicaid. The system was originally set up as a demonstration in 17 facilities. Since January 1991, the state established a primary care

6. Tenan et al., op cit.

Figure 1
Products of Ambulatory Care Classification Matrix

	Diagnostic investigation	Therapies	Problem management	Well care
Patient Classes	Class I	Class I diagnostic examination PAC #3	Class I management PAC #4	Child well care PACs #1 and 2
	Class II	Class II diagnostic examination PAC #7	Class II management PAC #8	Adult well care PAC #6
	Pregnant women	1st visit prenatal PAC #9	Prenatal I PAC #10	Prenatal II PAC #11
	Reproductive care	Reproductive diagnostic examination PAC #13	Reproductive management PAC #14	Routine gynecological examination PAC #12
	Class III	Class III diagnostic examination PAC #15	Class III management PAC #16	
	Class IV	Class IV diagnostic examination PAC #17	Chemotherapy/radiotherapy PAC #18	Class IV management
	Class V		Class V therapy PAC #20	
	Any patient	Diagnostic examination with NUC.CAT PAC #24	Medication administration PAC #5	
	Speech and rehabilitation	Audio examination PAC #21	Speech and rehabilitation PAC #23	
	Ophthalmology	Ophthalmology diagnostic PAC #22		
Service Categories				

Source: Tenan et al., op. cit.

Figure 2

Products of Ambulatory Care Patient Class Groups

Patient Classes	Class I	■ Children age 0 to 17 receiving well care or treatment for disorders of the ears, nose, and throat, muscle/skeletal, skin, gastrointestinal systems, or infections, injuries, and non-specific conditions
	Class II	■ Patients age 18 years and over receiving well care or treatment for disorders of the ears, nose, and throat, muscle/skeletal, respiratory, skin systems, or infections, injuries, and non-specific conditions
	Pregnant women	■ Care of women in the pregnant state after pregnancy has been confirmed
	Reproductive care	■ Care of the male or female reproductive systems including contraceptive and postpartum care
	Class III	■ Patients of all ages receiving care for arthritis or congenital problems or disorders of the circulatory, neurological, urological, endocrine, and gastrointestinal (for adults over 17) systems
	Class IV	■ Patients with oncological or hematological disorders ● rdudiq simple anemias
	Class V	■ P&nts of all ages receiving counseling for mental illness, substance abuse and social problems
	Any patient	■ Any patient receiving a CAT scan, nuclear imaging or where the visit is for medication administration
	Speech and rehabilitation	■ Patients visiting an audiologist and visits to speech rehabilitation, occupational, or physical therapy clinics or therapists
	Ophthalmology	■ Any patient of an ophthalmology clinic

Source : Tenan et al., op. cit.

initiative which makes PAC rates available to eligible designated care providers on a voluntary basis. Participating facilities provide the claims data in a prescribed format so that PAC classification can be made. These claims are subjected to a software package that assigns them into one of the **24 PACs** and hence into payment groups. A clinic visit is normally the necessary starting point for the package of services covered under a particular PAC. If ancillary services are ordered but not performed at that particular point in time, the patient's record is flagged so that when the ancillary is performed it will be included in the calculation of the PAC and the resulting payment. Moreover, if the delayed ancillary service is a key technology, the PAC assignment would be affected. In **any case**, the delayed ancillary is not separately reimbursed, but rather 'considered part of the visit package. Each patient is assigned to only one PAC for that visit.

If the patient returns to the clinic to again see a physician, a new PAC visit is triggered. Patients referred to an outpatient clinic for ancillary services by a physician outside the clinic 'are not included in the PAC system. The test is paid under a different mechanism-a procedure-specific **fee**. New York has found that this is generally for radiology services.'

New York's experience indicates that about **80** percent of all visits fall into therapeutic, management, and well care services. These are generally patients in the midst of an easily diagnosed acute episode, or with chronic problems. Resource-intensive diagnostic services constitute the remaining **20** percent. Thus, most of the PAC claims are for routine visits and do not involve large numbers of ancillary services.

7. Conversation with New York Department of Health staff.

Success of the **System** in **Explaining** Costs

One of the tests of a payment system is how well it reduces the variance in the costs of services. Services that require similar resource use ought to be grouped together so that providers are reasonably compensated for the costs of providing care. Consequently, differences in resource use should be greater across the groups than within the groups for any payment system. **Two** measures indicate the success of a payment system: the extent to which the system reduces the overall variation in resource use (usually measured by an analysis of variance technique) and the coefficients of variation within the groups or categories. Coefficient of variation is defined as the standard deviation divided by the mean; the lower the coefficient, the tighter the distribution around the mean. Thus a low coefficient of variation—usually less than **1**—within each PAC would be an indicator of a grouping for which the mean does a good job of capturing resource use for all the claims in the group.

New York State Department of Health (**DOH**) staff estimated that the PAC system reduced **65** percent of the variation in the value of resource use for its **10,000** sample cases.⁸ The coefficients of variation within each PAC generally ranged between **.31** and **.90**. The developers of the system compare this to the DRG system which originally explained 61 percent of the variability in resource use. Thus, for the sample under study, this **24** payment system met the test of a simple, clinically significant system that explained a reasonable amount of the variation in resource use.

8. Tenan et al., op cit.

OUTPATIENT SERVICE USE IN NEW YORK STATE

As part of this project, we first looked at how New York's experience with hospital outpatient services might differ from the rest of the country. In many ways, New York is often viewed as having an unusual health care system. New York State relies heavily on regulatory activity; for example, it closely regulates what hospitals may charge all patients. As described below, its patients and providers differ in many ways from the country as a whole. Thus it is natural to ask whether its health care system is so different that the PAC system might not be appropriate elsewhere. The specifics of this analysis are presented in a separate paper; the results are highlighted here.⁹

This part of the analysis concentrated on differences at the hospital level using American Hospital Association data for 1987. We were particularly interested in hospital outpatient departments (OPDs) since that is the area under consideration for payment reform in Medicare. Consequently, this part of the analysis focused only on hospital outpatient departments. It is important to note, however, that the PAC system in New York was designed to include freestanding clinics as well, thus capturing an additional group of patients.

Characteristics of Ambulatory Care Providers and Service Patterns

Overall, we found a much greater reliance on hospital outpatient departments in New York State than for the rest of the United States. For example, the total number of outpatient visits per New York resident, per year, was 1.477, but only 1.088 per person residing elsewhere. Moreover, facility sizes tend to be larger so that New York OPDs have a considerably larger volume

9. Marilyn Moon, Margaret Sulvetta, and Mark Miller, "Applying PACs to Medicare: A Comparison of Outpatient Settings in New York and the Rest of the U.S.," Urban Institute Working Paper 3855-01, March 1990.

of services than generally found elsewhere. In New York, the average hospital had 102,475 outpatient or emergency room visits as compared to less than half that amount-42,931-for the rest of the United States. Hospitals with large numbers of outpatient services may be less sensitive to problems with outliers; standardized payment levels may work better when such large numbers are present.

A number of other differences in the prevalence of outpatient services arise when looking at the characteristics of the facilities in which they are performed. For example, outpatient services in New York are more likely to occur in large (over 400 bed) facilities, in large urban areas and in government-owned facilities. While the volume is larger overall in New York, hospitals with these characteristics perform an even greater than average share of outpatient services. Average visits to hospitals with more than 400 beds was 247,423 in New York as compared to 145,926 elsewhere.

Since so many services are performed in OPDs in New York, it is likely that more routine services are performed in that setting as compared to the rest of the United States. There is little to indicate that New York's population is sicker, and certainly the outpatient department does not seem to disproportionately serve as an alternative to inpatient care. Consequently it seems likely that outpatient departments serve as primary care sites for many New York residents. This becomes particularly important in evaluating PACs if it means that basic, follow-up services are performed in OPD settings in New York. We might thus expect to see a different mix of patients and services in a national program than in New York.

On the other hand, we also found that New York facilities are more likely to offer a broad range of services such as speech therapy or CAT scans and MRIs. For example, over 73 percent of facilities in New York have speech

therapy departments as compared to 51 percent in the rest of the U.S. The proportions with CAT scans or MRIs are closer-93 percent in New York, 89 percent elsewhere. These data do not permit us to look specifically at the proportion of patients receiving such services, however. Thus, some of the additional patients seen in New York's outpatient departments are likely receiving high technology services, but they may not account for a higher proportion of the total.

We concluded in our earlier paper that we might expect considerable differences when PACs are applied to a nationwide sample of elderly and disabled patients. In particular, since we look only at hospital outpatient departments, which are used less intensively in other states than in New York, we might expect to see different patterns of service use. This might mean either a different distribution of PAC groups between New York and the rest of the U.S. or differences in the ability of PACs to capture variation in costs.

ISSUES FOR MEDICARE

Beyond the issue of differences between New York and other states are a number of other issues that arise when applying PACs to Medicare. The enormous growth in the use of hospital outpatient departments nationwide has signaled the need for attention to the way in which such visits are reimbursed. Much of the attention has focused on ambulatory surgery in those settings: growth in these procedures and their size relative to other ambulatory services dictate such emphasis. Nonetheless, physician visits and attendant ancillary service use raise a number of interesting and unique challenges as well.

First, it makes sense to view these complicated visits as packages that might best be bundled into one payment. In the PAC system, not only are all

facility services associated with one visit combined into one payment, but payments for the facility and the professional services are also combined.¹⁰ Concern over the volume of services used as well as the prices paid makes a bundled payment system particularly attractive. The PAC system is one of the few payment systems for ambulatory care that bundles a variety of services. However, Medicare's current payment structure and data systems are not very amenable to an easy transition, posing both conceptual and data problems. Implicitly, a bundled system assumes a close relationship between the hospital or facility and the physician that may not always be true in practice. Moreover, this relationship may vary around the country in different settings. Physicians who now bill separately under Medicare would need to develop new arrangements with hospitals and Medicare would have to build a whole new data tracking system.

In addition, bundling may not always be appropriate since a substantial number of services performed in a hospital outpatient setting are "referred ancillaries"-radiology and lab services performed on patients who are referred to the facility by physicians practicing elsewhere. In the PAC system in New York, these referred services are paid under a procedure-specific fee schedule. Even if Medicare could physically link these bills in the data, a bundled system might not make sense if it further divided the way that physicians are paid for similar services. In such cases, neither the physician nor the hospital has control over the other; bundled payments implicitly assume more formal relationships that can result in financial accountability.

10. In practice, the term bundling is used in many contexts, to combine services, or to combine payments to facilities and professionals, for example. Here we use a "bundled" system to refer to both of these components. Payments to facilities and physicians are combined as are multiple procedures around the visit to the OPD.

Another difference that may be critical when applying **PACs** to Medicare is that it was designed for a patient population receiving routine as well as specialty care. Medicare patients are more likely to obtain routine care in a physician's office, leading to the likelihood that the combination of services would differ between the New York Medicaid system and a nationwide Medicare system. Moreover, to the extent that the development of the PAC system was influenced by patients receiving care under a poorly reimbursed Medicaid system, there may be another bias to less intensive-care in New York's PAC system than when applied to Medicare. That is, these patients might be less likely to receive large numbers of ancillary services and even less likely to receive expensive technologies that trigger assignment to a diagnostic PAC.

Finally, the **PAC** system in New York was designed to meet the needs of all age groups. When applied to the elderly and disabled, a different mix of services will likely result. Some **PACs** will be irrelevant--well baby care, for example, is precluded by definition from the data. In other instances, Medicare patients are likely to have many more visits for arthritis or diabetes than the general population. **PACs** number 15 and 16 seem to be particularly likely candidates for heavy Medicare use.

Thus, we should expect that even a "successful" transfer of the PAC system to Medicare might result in areas that would require adjustments for different patient mix and patterns of service use. These issues suggest that resources within the PAC groups need to be closely examined. Problems that arise from these differences do not reflect on the methodology but rather the issue of "calibrating" the groups to a different population.

At a minimum, the adjustments necessary to meet data problems in applying **PACs** to current Medicare administrative data complicate the analysis. Thus, a major portion of this project involved manipulating the data to meet the

specifications of the PAC grouper. Those technical adjustments are the subject of the next section.

II. ADJUSTMENTS NEEDED TO APPLY PACs TO MEDICARE

To establish the relevance of the PAC system as a possible reimbursement tool for Medicare, adjustments were necessary to apply Medicare data to the PAC grouper. The PAC system was developed to use claims specially coded to provide all the necessary information and in the appropriate form to be placed into one of 24 groups. Medicare data, on the other hand, reflect the records required by HCFA to pay claims and do not necessarily have all the required information for grouping claims into PACs. Fortunately, most of the key variables are available from the Medicare data, requiring only a few simplifying assumptions.

This section describes the data bases used and how the data have been modified for use in this analysis. Wherever possible, we have tried to replicate the data construction used in New York's PAC system. Certain differences in available data place some constraints on our findings, however, and these are described below as well. We begin with a discussion of the Medicare data sets and the physical adjustments necessary to transform our data for use with the PAC software. Finally, after successfully grouping the data, the Medicare file was statistically trimmed to eliminate unreliable charge information.

INITIAL DATA MANAGEMENT ISSUES

Once we determined that it would be possible to modify the HCFA claims data for use with the PAC software, we proceeded with three basic steps: (1) creating a merged Hospital Outpatient Department/Part B Medicare Annual Data System (HOP/BMAD) file for analysis, (2) making adjustments so that the PAC

grouper would run on this merged database, and (3) limiting the data to claims that should be subjected to the PAC grouper..

Creating the **Merged HOP/BMAD** File

The PAC system requires information on both facility and physician use of services. The Medicare data system, on the other hand, treats separately facility bills and physician and other provider bills. Different forms are used and the data systems that summarize these bills vary substantially. Consequently for this analysis, we merged two major 1987 data files from HCFA's administrative records: the hospital outpatient department (HOP) file and the BMAD beneficiary files that capture physician charges. Both these data bases are five percent **files**, capturing information for a five percent sample of Medicare beneficiaries.

The HOP file is organized on a claim basis; each record represents a claim and can include more than one procedure. It includes information on the beneficiary (including a unique patient identifier), the date of service, facility charges, up to 28 HCPCS (HCFA Common Procedure Coding System) codes, up to three ICD-9 (International Classification of Disease, 9th Revision) procedure codes, and five ICD-9 diagnosis codes for each claim. However, on the HOP file, medicine procedures, which are the subject of this study, are not coded and thus we must look elsewhere to determine what procedures were done.

The second major data file used is the BMAD beneficiary file of physician services. This file is organized by line items representing single procedures (e.g., office visits, immunizations or testing procedures). Each claim that a physician **submits** may contain multiple line items, although most claims consist of only one line item. Information on this file also includes patient data (again with the unique identifier), dates of service, a HCPCS procedure code

for each line item, Medicare's submitted and allowed charges for that procedure for that physician, and place of service indicators (which, however, are not always reliable).¹¹ Dates of service include a "from" and "through" date since a multiple procedure claim may capture procedures performed on different dates.

For this project we use a merged data base that appends the BMAD files to the Hospital Outpatient (HOP) files for 1987. Additional details of the merging procedure are available elsewhere;¹² this section briefly summarizes the techniques used. The merge allows us to combine facility and physician charge information in ways consistent with the "bundling" of services that PACs achieves. Moreover, the merge allows us to alleviate coding deficiencies that occur if the hospital outpatient department (HOP) file is used alone. These coding deficiencies include the absence of medicine procedure codes and inconsistent coding of surgical procedures. Beginning in the summer of 1987, hospitals were required to convert from ICD-9 surgery procedure codes to HCPCS procedure codes at the beginning of their fiscal years. Also late in 1987, hospitals were required to begin coding radiology and pathology/laboratory procedures.

The linking of the BMAD and OPD files allows us to provide a more comprehensive picture of services provided in the hospital outpatient department. BMAD line items, each of which have a HCPCS code, are attached to hospital outpatient claims. The completed merged file is actually the product of four separate merges that began with 1,993,246 outpatient claims from the

11. For a discussion of place of service coding problems, see Colin P. Flynn and Margaret B. Sulvetta, "Descriptive Analysis of Surgery in Three Ambulatory Settings," Urban Institute Working Paper 6089-01, February 1991.

12. Mark Miller and Margaret Sulvetta, "Medicare Hospital Outpatient Department Services: A Descriptive Analysis," Urban Institute Working Paper, 3725-01-03, August 1990.

1987 hospital outpatient five percent sample beneficiary file and 35,645,277 line items with valid HCPCS codes from the 1987 BMAD five percent sample beneficiary file.

The first merge is based on patient identification and "through date" only. Claims were merged only if these two items matched. Then, each successive match allowed some flexibility in the date, eventually creating a match plus or minus two days, or using the "from" rather than the "through" date on **BMAD**. Claims not meeting these criteria were not included in the merged **HOP/BMAD** file. Just over 66 percent of all HOP claims could be matched using this technique, and of that group, 86 percent of the matches were achieved on the first, and most restrictive, pass.

The merged file was further adjusted to eliminate duplicate claims. Such problems often arise from credit and debit adjustments **to the** claim. This adjustment process ultimately eliminated 20,221 additional HOP claims, a loss of about 1 percent. Additional editing checks indicate that the merged file offers a reasonable base for analyzing hospital outpatient claims. Analysis indicates that the distribution of claims by broad category of **service** (i.e., surgery, nonsurgery) is the same in the matched and total file. The distribution of claims by fiscal intermediary is also consistent across the two files. Therefore, as far **as can be** determined, the merging of the files has not created any systematic biases in the sample. If systematic bias had been introduced during the merging process, it would most likely involve the disproportionate exclusion of referred ancillary visits, that is visits to the **OPD** solely for the purpose of a laboratory or radiology test. Those visits are **the** least likely to have an associated physician claim. However, since the PAC system requires that every claim include a visit, such claims have been deliberately excluded from the analysis anyway.

The information available for determining the activities that have taken place include revenue trailers on the HOP file that indicate specific revenue centers used during the visit (e.g., general clinic, ophthalmological clinic). This can be helpful, for example, in identifying clinic visits. The merged file also creates a “unified” set of HCPCS codes that first chooses any codes from the HOP record. In those cases where no codes are available (52 percent of the time), the **HCPCS codes** from the matched **BMAD** records are used.

Adjusting the Data for Grouping by PAC

Although the merged Medicare data set contains most of the information needed to run the PAC software, several adjustments were necessary to compensate for missing information. (The quality of the Medicare data when used for grouping into **PACs** may also raise other issues discussed below.)

Figure 3 indicates the specific data elements necessary to run the algorithm that assigns a visit into a PAC. Asterisks are used to indicate whether the data are available on our Medicare merged file. In four instances we needed to **make** some additional adjustments to run the software.

First, the indicators of first or new visits are not available in an appropriate form with the Medicare data. This was mainly a problem in identifying first prenatal visit—a variable not very important for the Medicare file since very few Medicare beneficiaries give birth. Consequently, we assumed that none of the claims were first prenatal visits, assuring that no Medicare beneficiaries are found in PAC group 9 (see Figure 1).

Second, since the PAC grouper uses age of patient, we examined the Medicare data for reliability of that variable. When the Medicare status code indicates the beneficiary was aged, all claims where age is listed as 18

Figure 3
Data Elements Required
to Run PAC Software

Elements	Available
Facility ID Number (MMIS Facility Code)	*
MMIS Facility Locator Code	*
Clinic Code	*
Provider Type	*
Unique Visit Identification Code	*
Visit Date	*
Patient Date of Birth	*
Medicare Number or Social Security Number	*
Patient Sex	*
Principal Diagnosis	*
Secondary Diagnosis (if present)	*
Other Secondary Diagnosis (if present)	*
Laboratory Testing (up to 10 HCPCS codes)	*
Radiology, Ultrasound, Nuclear Medicine (up to 10 HCPCS codes)	*
Procedures (up to 5 HCPCS codes)	*
First Clinic Visit	
First Pre-Natal Visit	
First Provider Visit	
New Diagnosis	
Patient Zip Code	*
Op Cert Number	*

through 64 were eliminated. (Those with ages less than 18 were assumed to be over **100**.) This adjustment eliminated **2, 023** claims.

Third, not all the clinic identifiers were available on Medicare. Three are required for PAC assignment: ophthalmology, audiology, and rehabilitation. Audiology and rehabilitation were available as revenue trailers on the HOP file, but ophthalmology clinics were not identified. Instead, we identified HCPCS codes that would indicate use of ophthalmological services and used those codes as a proxy for ophthalmology clinic visits. Thus, if a claim contained any of those HCPCS codes we assumed the visit was provided in the relevant ophthalmology clinic (see Figure 4). The HCPCS codes included in Figure 4 were intended to be as inclusive as possible and do include, for example, emergency room visits.

Finally, also eliminated from the merged file were claims which were made up entirely of routine venipuncture. Routine venipuncture is technically a surgical procedure, and from experience with other analyses, we believed it was appropriate to explicitly exclude it from the analysis. When drawing of blood is the only activity, the claim was not subjected to the PAC grouper. This adjustment eliminated **4, 458** claims. (This is a relatively low number compared to other studies since we have combined claims with ~~BMAD~~—which results in a lower likelihood of venipuncture-only claims.)

The file was now technically ready to be subjected to the PAC grouper. A final set of adjustments was needed, however, to assure that only appropriate claims would be grouped since the PAC program does not check for appropriateness of the claim. In New York State, facilities submit only those claims that fit the definitions of appropriateness through the grouper, and consequently the grouper program itself contains no formal edit checks of this type.

Figure 4

Revenue Trailers and HCPCS Codes Used
to Classify Claims as Clinic Visits

Revenue Trailers from HOP File

Physical Therapy^a
Occupational Therapy^a
Speech Therapy^a
Emergency
Audiology^b
Clinic
Free Standing Clinic
Medical, Social Services
Psychiatric

HCPCS Codes from BMAD File

90000-90080
90200-90292
90500-90590
90600-92371
92507-92977
93000
93010
93014-93015
93018
93040
93042
93201
93204-93205
93209
93220
93222
93258-93263
93270-93277
93501-93562
93720
93722
93784-93790
93799
93850-95082
95115-95858
95880-97799
99050-99065
99150-99154
99160-99175

- a. These trailers are used to assign claims to PAC #23.
- b. This trailer is used to assign claims to PAC #21.

Identifying Appropriate **Claims** for the PAC System

Two major sets of exclusions of inappropriate claims must be made to derive a final set of claims for analysis: surgical claims and claims without a clinic visit.

All claims that could be included in New York State's Products of Ambulatory Surgery (PAS) system that classifies surgical visits had to be excluded.¹³ Since the PAS and PAC programs were established with the intention of operating as two separate reimbursement systems, we ran the PAS first to purge the data set of surgical records. While the PAS system identifies distinct HCPCS codes, the PAC system relies primarily on ICD-9 diagnosis codes. Running the PAC grouper on the full merged data base will thus group surgical claims even though the system is not designed to handle such claims. It will assign such claims to a PAC on the basis of diagnosis; the software has no screen to eliminate surgical procedures. In New York, claims are screened before they are grouped and surgical procedures are handled under the separate system.

Running the PAS on Medicare claims data eliminated 126,976 surgical claims from the merged file. There can be a complication, however, since 76,352 of these claims also have nonsurgical HCPCS codes as well. For purposes of our initial analysis, we ignored those claims since it is not possible to disaggregate the charges and assign some to the surgical procedures and the rest to the nonsurgical services used.

These various adjustments left us with a total of 1,108,118 OPD claims. These claims were now ready to be passed through the grouper; they represent

13. For additional information concerning the PAS system, see Margaret Sulvetta, "Evaluating Prospective Payment Options for Outpatient Surgery: A Seven System Analysis," Urban Institute Working Paper 3725-01-04," March 1991.

all nonsurgical outpatient claims that could be matched to one or more **BMAD** line items that occur within a two day period. On a first pass, we were able to group **1,107,369** claims; only 749 claims could not be grouped. The two reasons why the program was unable to group claims were the lack of a primary diagnosis code (89 percent of the cases) or an illegal sex code (11 percent).

Upon close examination, however, we determined that yet another adjustment was necessary to the files. The PAC system is designed to reimburse for outpatient services that begin with a clinic visit and which may or may not include ancillary services. Thus, a visit originating in a hospital OPD clinic is the key identifier for determining whether the visit is eligible for PAC assignment. The ancillary service visit may occur on a separate day and if that is all that occurs, it would be grouped with the originating clinic visit in which the test was ordered. When individuals visit a hospital outpatient department to obtain a test ordered as a result of a community office visit, the event is outside the PAC process and not included in the payment system. These "referred ancillary" services are not intended to be part of the system where the goal is to bundle visits, tests, and nonsurgical procedures. Again, since New York State screens claims before they go into the PAC system to be grouped, these ancillary-only claims are never processed. The grouper itself does not screen out such claims. However, such referred visits are present in the Medicare data.

Thus, one last set of adjustments to Medicare data was necessary to simulate the PAC system. First, we worked with New York State staff to try as much as possible to identify those claims that would meet the test of applicability to the PAC system in New York. We then sorted the file to determine which claims had no visits that would place them in the PAC system. Over half of all claims (50.4%—557,679) fall into this category. Only 549,690

claims on our file have a qualifying clinic visit as indicated by the HOP revenue trailers or the HCPCS code on the merged file. The revenue trailers were checked first and if any of the revenue centers listed in Figure 4 were listed, a qualified visit to a clinic was assumed. Since the revenue trailer information is not always complete, we ran a second check on claims that were not treated as relevant visits under the first check: using the BMAD HCPCS codes that indicate a physician **visit**.¹⁴ If an identified code (also listed in Figure 4) was part of the merged claim, it was also classified **as** a clinic visit and retained in the file.

The next step was to match the non-office visit claims to a patient's earlier claims in which the tests might have been ordered. The rule we used was to search an individual's file forward in time for up to 30 days after an office-visit claim for a non-visit OPD claim. If any were found, they were merged with the office-visit claim and then the combined.claim was put through the PAC grouper again. Because new ancillaries will have been added to the initial claim, some shifting across **PACs** occurs. For example, if an individual visits a clinic on one day and receives only a physical exam, the PAC would be of a management type. If the patient then visited the OPD again 4 days later and received a key technology ancillary, the appropriate PAC would be a diagnostic one.

This is essentially how the New York PAC system **works**, although they have better mechanisms to track and combine all relevant ancillaries onto a claim. In New York, at the time of the clinic visit, a flag is placed in the patient's

14. Since this adjustment may sometimes incorrectly combine a physician office visit that occurs on the same day as an OPD ancillary visit into one claim, we later removed these claims to see if their inclusion affected the results. PAC distributions with and without these claims change little. See Appendix A.

file indicating that tests have been ordered. Generally, the facilities track for 30 days, and a few follow the records for 60 days. Facilities pick up about 95 percent of all ancillaries within the 30-day period.¹⁵

The process of matching non-visit claims to earlier visit claims combined 56,277 records. That is, 10.1 percent of all the non-visit claims could be combined with a visit claim. Consequently, the PAC grouper is ultimately applied to 54.7 percent of all the relevant nonsurgical OPD claims. Presumably the other 45.3 percent would have to be reimbursed under some other type of mechanism.

These various steps are summarized in Figure 5, which indicates the number of claims left at each step in the process.

THE DISTRIBUTION OF MEDICARE CLAIMS BY PAC

After all the adjustments described above, the Medicare data were distributed among the PAC groups as shown in Table 1. The 24 PAC groups are divided into two broad service groups: diagnostic investigation and management services (again see Figure 1). Management services include general problem management, therapeutic services and well care. The major difference between diagnostic and management services is the presence of claims for key technologies (non-laboratory technologies such as ultrasounds, stress tests and CT scans). At least in theory, the diagnostic services should be more resource intensive.

In addition to service categories, the PAC system differentiates between patients (age and sex), and, more important, type of body system affected.

15. This information was provided in communications with New York Department of Health staff.

Figure 5
Summary of Data File Manipulation

Level	Description of File and (Grounds for Eliminating Claims)	Number of Claims Eliminated	Number of Claims
1	Initial HOP/BMAD File After Basic Adjustments		1,235,094
	(Ran PAS Grouper to Eliminate Surgical Claims)	126,976	
2	Nonsurgical Claims		1,108,118
	(Ran PAC Grouper for First Cut)	749	
3	Claims that <u>Could</u> Be Grouped in PACs (Eliminated Referred Ancillary Claims)	557,679 ^a	1,107,369
4	Full PAC File		549,690
5	PAC Claims after Trimming		507,417
6	PAC Claims Excluding ESRD		500,611

a. An additional 56,277 of these claims were combined with Level 4 claims (but total number in Level 4 does not change).

Table 1

Medicare PAC Distribution, Full File

PAC #	Description	Percent of Claims
7	Diagnostic Investigation, Class II, Adult 17+	23.8%
16	Management of Class III Problem	22.7
8	Management of Class II Problem, Adult 17+	22.0
15	Diagnostic Investigation of Class III Problem	11.6
24	Diagnostic Investigation with Nuclear or CT Scan	4.2
22	Opthamological Services	3.1
23	Speech and Rehabilitation Therapy	3.1
19	Management of Class IV Problem (with malignancies)	2.7
20	Management of Class V Problem (mental illness,. substance abuse	2.3
17	Diagnostic Investigation of Class IV Problem	1.3
14	Management of Reproductive Problems	1.0
18	Management of Chemotherapy and Radiotherapy Treatment	0.9
13	Diagnostic Investigation of Reproductive Problem	0.7
21	Audiological Testing	0.4
6	Annual Examination, Adult over 17	0.1
5	Medication Administration	0.1
12	Annual Gynecological Examination	*
11	Prenatal Revisits, Age 19-34	*
10	Prenatal Revisits, Age over 34 or under 19	*
4	Management of Class I Problem, Child 0-17	*
3	Diagnostic Investigation of Class I Problem, Child 0-17	*

* Rounds to less than 0.1%

n = 549,690

There are five body system categories or classes, as well as separate categories for pregnant women, reproductive care, speech/rehabilitation and ophthalmology.

For the Medicare data for 1987, the most important categories, by far, are for Class II and Class III problems. The management and diagnostic service categories for these two classes account for just over 80 percent of all the classified bills. Class II problems include musculoskeletal, nutritional, ear, **nasopharynx** , respiratory , skin, infections; and injuries. Class III problems refer to the adult digestive and hepatobiliary system, the nervous system, the circulatory system, the urological system, arthritis, rheumatism and other inflammatory/degenerative diseases of the joints and bones, diabetes and other metabolic problems and diseases of the endocrine system and pancreas, congenital disorders, and patients with medical problems attendant to mental illness, alcohol and drug abuse, social problems and physical medicine.

The PAC grouper did not categorize any of the Medicare claims into PACs 1, 2 or 9. PACs 1 and 2 are for well baby care examinations and PAC 9 is initial prenatal evaluation. Well baby care would not be covered by Medicare. Since we did not have information on first visit, any prenatal care was assumed to be a revisit and would show up in PACs 10 and 11 rather than 9. The small number of observations in PACs 3 and 4 is attributable to the small number of children on Medicare-usually as end stage renal disease (ESRD) patients. Similarly, prenatal visits are infrequent for a primarily elderly population. In addition, since Medicare does not cover routine physicals, it is also reasonable to expect that PACs 6 and 12 would contain few, if any, claims.

The regrouping of the office-visit PACs to reflect ancillaries that occurred on later days results in predictable changes in the PAC groupings. That is, the three PACs with the largest gains are the diagnostic ones and the

largest losers are the management categories. When additional ancillary services are added to the visit claim, patients shift into the diagnostic and out of the management categories.

CHARGE INFORMATION AND DATA TRIMMING

An additional issue of data quality arises with the charge information on the records that were grouped by PAC. Unusually high or low bills are more likely to reflect problems in the data than the actual charge distribution attributable to facilities and BMAD providers. Consequently, we considered several possible adjustments to trim the data set to eliminate unreliable payment data.

The payment data being examined combine the facility payment and the physician allowed charges under BMAD. The PAC system reimburses outpatient facilities using such a combined payment, so the distribution of-charges includes all the relevant Medicare payments consistent with PAC methodology. The facility payment is derived by subjecting submitted charges to the facility average cost-to-charge ratio using information from the HCRIS (Hospital Cost Reporting Information System) file. This gives us an estimate of facility costs. The BMAD charges are taken from the reported Medicare allowed charge for each line item. When the two pieces are combined, we refer to the result as the "total combined payment" for each PAC claim. That is, the components each represent Medicare payments as now calculated, and we create a "combined" payment amount as if the claims were bundled together.

The first adjustment to the file was to discard all claims with missing data or for which total combined payments were zero. Since we are focusing on resources expended for the total visit (and in some cases multiple visits) to

the outpatient department, we expect the total combined payment to be greater than zero. Of the 549,690 claims in the final PAC distribution, 33,629 (or 6 percent) have total combined payments or facility charges of zero and are excluded from further analysis. Most of these claims are excluded because the cost-to-charge ratios were not available. The Hospital Cost Reporting Information System (HCRIS) file used to obtain cost-to-charge ratios only contains information for hospitals. It is thus likely that those excluded claims which did not match the HCRIS file were from another provider type, such as a renal dialysis center. We then subjected the remaining 516,061 PAC claims to additional trimming analysis.

To see how sensitive the distribution of charges would be to very high and very low values, we created a lognormal distribution of combined payments for the whole sample and for each PAC category and calculated standard deviations on that distribution. Next, we created new distributions of PACs assuming elimination of claims with total combined payments that fall above or below a set number of standard deviations around the mean. We looked at three alternatives: 2, 2.5 and 3 standard deviations above and below the mean of the lognormal distribution.

The sensitivity of the analysis to this trimming is illustrated in Table 2. The effects of three different trimming alternatives are shown for the whole file and for the five largest PACs (which together account for 85 percent of the claims). The columns in the table indicate the number of claims remaining after various trimming approaches (and can be contrasted with the untrimmed total in each category). Also shown are the mean value of combined payments and the highest and lowest value for each of the distributions. Generally, even the least stringent trimming approach of plus or minus 3 standard deviations eliminates the most extreme values. Since the

Table 2

Impact of Alternative Trim Points for
Top 5 PACs and Full Sample

PAC and Number of Standard Deviations Used	Number of Claims	Total Average Combined Payment	Coefficient of Variation	Minimum Value	Maximum Value
PAC 7					
All	124,185	\$209.35	1.04	\$ 7	\$15,617
+ o r - 3	123,394	198.67	.76	22	1,224
+ o r - 2.5	122,428	192.97	.70	30	874
+ o r - 2	119,663	184.48	.62	42	623
PAC 16					
All	115,726	182.60	1.69	a	12,048
+ o r - 3	115,135	169.33	1.33	5	1,994
+ o r - 2.5	113,588	152.62	1.09	9	1,219
+ o r - 2	110,877	140.19	.94	15	745
PAC 8					
All.	114,040	136.54	1.45	1	7,573
+ o r - 3	113,382	127.23	1.07	6	1,241
+ o r - 2.5	112,429	121.77	.97	10	798
+ o r - 2	109,303	111.99	.84	15	513
PAC 15					
All	60,433	296.69	1.22	7	11,337
+ o r - 3	59,912	274.68	.86	24	1,944
+ o r - 2.5	59,251	262.15	.75	35	1,349
+ o r - 2	57,696	249.72	.65	50	936
PAC 24					
All	21,622	589.67	.68	17	7,848
+ o r - 3	21,381	573.89	.56	103	2,521
+ o r - 2.5	21,113	563.08	.51	133	1,935
+ o r - 2	20,511	547.11	.45	173	1,479
WHOLE FILE					
All	516,061	215.07	1.43	a	15,617
+ o r - 3	512,722	202.11	1.16	3	10,262
+ o r - 2.5	507,417	191.82	1.06	6	6,069
+ o r - 2	494,660	180.22	.97	10	3,382

a = trace

distributions are skewed to the-right, all the trimming alternatives result in lower average mean values for combined payments. Finally, the coefficient of variation (CV) is also included in the table for each alternative and each PAC. Trimming the data by definition lowers the CV, but the degree to which it falls indicates how sensitive our findings are to the extremes of the distribution.

Hospital data used in calculating the inpatient DRG system restrict data to 3 standard deviations above and below the mean; Urban Institute studies of other outpatient payment systems generally use 2.5 standard deviations or eliminate the top and bottom 5 percent of the distribution. For the rest of this analysis we have used the 2.5 standard deviation formula. This approach discards only an additional 8,644 claims, but seems to eliminate the most extreme values and reduces the CV substantially in most PACs. The trimmed file thus has 507,417 claims. Basing the analysis on trimmed data does not mean we are attempting to artificially distort the results, but rather to reduce the potential impact of what are likely to be incorrectly reported payments.

The final distribution of PACs, once the data extremes have been eliminated, is shown in Table 3. It changes very little from the distribution of Table 1 which was based on all records included in the original PAC grouper program. This trimmed file forms the basis for the rest of the analysis.

COMPOSITION OF TEE PACs

After assigning the claims to PACs and trimming the data, we examined the five largest PAC groups to determine what ancillaries were most commonly performed and what were the most common diagnosis codes. Since the five PAC groups include both the management and diagnostic categories for Class II and

Table 3

Medicare PAC Distributions After Trimming

PAC #	Description	Percent of Claims
7	Diagnostic Investigation, Class II, Adult 17+	24.1
16	Management of Class III Problem	22.4
8	Management of Class II Problem, Adult 17+	22.2
15	Diagnostic Investigation of Class III Problem	11.7
24	Diagnostic Investigation with Nuclear or CT Scan	4.2
23	Speech and Rehabilitation Therapy	3.1
22	Opthamological Services	3.1
19	Management of Class IV Problem (with malignancies)	2.6
20	Management of Class V Problem (mental illness, substance abuse)	2.3
17	Diagnostic Investigation of Class IV Problem	1.3
18	Management of Chemotherapy and Radiotherapy Treatment	0.9
14	Management of Reproductive Problems	0.9
13	Diagnostic Investigation of Reproductive Problem	0.7
21	Audiological Testing	0.4
6	Annual Examination, Adult over 17	0.1
5	Medication Administration	0.1
12	Annual Gynecological Examination	*
11	Prenatal Revisits, Age 19-34	*
10	Prenatal Revisits, Age over 34 or under 19	*
4	Management of Class I Problem, Child 0-17	*
3	Diagnostic Investigation of Class I Problem, Child 0-17	*

* Rounds to less than 0.1%

n = 507,417

Class III body groupings, this analysis also allowed us to check that the groupings were classifying the claims appropriately.

Table 4 indicates the ten most commonly used ICD-9 disease classifications for the top five PACs. PACs 7 and 8, which are intended to capture muscle/skeletal, infections, injuries, and unspecified conditions, show many of the same codes. The distinction between these two groups is that PAC 7 includes diagnostic investigation of the listed conditions, while PAC 8 includes management of these conditions. The presence or absence of key technologies determines the PAC assignment for a given diagnosis. Thus, diagnosis codes are frequently common to two PACs. In both PAC 7 and 8, unspecified chest pains rank first, followed by either abdominal pain or chronic airway obstruction. Pneumonia, which is fourth in the diagnostic PAC 7, does not make the top ten for management. Similarly, PACs 15 and 16, for arthritis, circulatory system, neurological, urological, endocrine, and gastrointestinal systems, have a number of overlapping codes. Hypertension is first on the list for PAC 16 and second for PAC 15. Diabetes mellitus, on the other hand, accounts for nearly 5 percent of the management cases (PAC 16) but less than 2 percent in the diagnostic category.

Finally, PAC 24 is a catchall category for anyone receiving CT scans or MRIs. The codes that show up here, as might be expected; indicate a number of disease categories involving headache, cerebrovascular disease, and abdominal pain. One code which appears in both PAC 24 and PAC 7 is v72.50. This is an ICD-9 diagnosis code which actually represents a procedure, "radiological exam, not elsewhere classified. " The classification of a claim by an unspecified procedure rather than by a true diagnosis code raises several questions.

First, since these codes are nonspecific, their inclusion may cause deterioration in the explanatory power of the system. Previous analysis of

Table 4
Ten Most Common Diagnosis Codes
for Five Largest PACs

PAC #7: Diagnostic Investigation, Class II, Adult 17+

Total Claims = 122,428

Total Number Diagnosis Codes = 1,873

ICD-9 Code	Definition	Percent of Claims	Cumulative Percent
786.50	Chest pain, unspecified	6.6%	6.6%
789.00	Abdominal pain	4.6	11.2
496.00	Chronic airway obstruction, nec	3.4	14.6
486.00	Pneumonia, organism unspecified	3.4	18.0
786.09	Dyspnea and respiratory abnormalities, other	3.0	21.0
490.00	Bronchitis, not specified as acute or chronic	2.7	23.7
V72.50	Radiological exam, not elsewhere classified	2.1	25.8
724.50	Backache, unspecified	1.6	27.4
466.00	Acute bronchitis and bronchiolitis	1.6	28.9
729.50	Pain in limb	1.5	30.5

PAC #8: Management of Class II Problem, Adult 17+

Total Claims = 112,429

Total Number Diagnosis Codes = 2,274

ICD-9 Code	Definition	Percent of Claims	Cumulative Percent
786.50	Chest pain, unspecified	6.5%	6.5%
496.00	Chronic airway obstruction, nec	3.8	10.3
789.00	Abdominal pain	3.3	13.6
780.40	Dizziness and giddiness	2.6	16.2
780.20	Syncope and collapse	2.4	18.6
786.09	Dyspnea and respiratory abnormalities, other	2.3	20.9
784.70	Epistaxis	1.9	22.8
493.90	Asthma, unspecified	1.7	24.5
729.50	Pain in limb	1.5	26.0
490.00	Bronchitis, not specified as acute or chronic	1.3	27.3

Table 4 (continued)
Page 2

PAC #15: Diagnostic Investigation of Class III Problem

Total Claims = 59,251		Total Number Diagnosis Codes = 1,484	
ICD-9 Code	Definition	Percent of Claims	Cumulative Percent
428.00	Congestive heart failure	7.1%	7.1%
401.90	Essential hypertension, unspecified	4.3	11.3
599.00	Other disorders of urethra & urinary tract	4.1	15.4
413.90	Other and unspecified angina pectoris	2.7	18.2
558.90	Other & unspecified noninfectuous gastroenteritis & colitis	2.6	20.8
715.90	Oseoarthritis, unspecified	2.4	23.2
564.00	Functional digestive disorders, n.e.c.	2.4	25.6
716.90	Arthropathy, unspecified	2.0	27.6
414.00	Coronary atherosclerosis	1.7	29.3
250.00	Diabetes mellitis without complications	1.7	31.0

PAC #16: Management of Class III Problem

Total Claims = 113,588		Total Number Diagnosis Codes = 1,570	
ICD-9 Code	Definition	Percent of Claims	Cumulative Percent
401.90	Essential hypertension, unspecified	8.8%	8.8%
250.00	Diabetes mellitis without complications	4.8	13.6
599.00	Other disorders of urethra & urinary tract	3.8	17.4
414.00	Coronary atherosclerosis	2.7	20.1
413.90	Other and unspecified angina pectoris	2.5	22.6
428.00	Congestive heart failure	2.3	24.9
427.90	Cardiac dysrhythmia, unspecified	2.1	27.1
427.50	Cardiac arrest	2.1	29.2
558.90	Other & unspecified noninfectuous gastroenteritis & colitis	2.1	31.3
784.00	Headache	2.1	33.3

Table 4 (continued)
Page 3

PAC #24: Diagnostic Investigation with Nuclear or CT Scan

Total Claims = 21,113

Total Number Diagnosis Codes = 1,851

ICD-9 Code	Definition	Percent of Claims	Cumulative Percent
784.00	Headache	3.6%	3.6%
436.00	Acute, but ill-defined cerebrovascular disease	3.3	6.9
789.00	Abdominal pain	3.1	10.0
786.50	Chest pain, unspecified	2.9	12.9
780.40	Dizziness and giddiness	2.4	15.3
435.90	Unspecified transient cerebral ischemia	2.0	17.3
780.20	Syncope and collapse	1.7	19.0
780.30	Convulsions	1.7	20.6
v72.50	Radiological examination, n.e.c.	1.5	22.2
185.00	Malignant neoplasm of the prostate	1.5	23.7

Medicare outpatient claims has shown that patients frequently receive chest X-rays in conjunction with other services, that is, chest X-rays appear to be performed frequently as part of a routine package of tests. This means that the provision of a chest X-ray does not necessarily indicate that a respiratory problem was the underlying reason for the visit. Therefore, use of the chest X-ray code to classify the claim into a PAC which includes specific disease categories may result in the grouping of unlike claims. Also, the use of a procedure code rather than a diagnosis code to group a claim can raise questions concerning the equity of the payment rate for such claims. If, for example, the patient had congestive heart failure (diagnosis code 428.00) and received a chest X-ray which was then coded as **V72.50**, the claim for that patient would be assigned to PAC 7 rather than PAC 15, presumably at a lower reimbursement rate. In general, the inclusion of V codes in the PAC system makes the system more comprehensive and complete, but it may involve a tradeoff with classification accuracy.

Table 5 indicates the most frequently occurring ancillary services for the top five **PACs**. Since claims may have more than one ancillary service, we show simple counts of the number of services performed.. Here we expect to see considerable differences between the diagnostic and management **PACs** in each patient class. First, we would expect the number of ancillaries relative to the number of claims to be lower for PAC 8 than for PAC 7. This is indeed the case. And a similar pattern holds for PAC 16 (management) as compared to PAC 15 (diagnostic).

Moreover, all three diagnostic **PACs** in the top five have as their most common ancillary service, radiologic chest exams. In contrast, the top two ancillaries for **PACs** 8 and 16 are routine urinalysis and hemogram (both of which also show up in the top ten for the diagnostic **PACs** as well). As

Table 5

Ten Most Common Ancillary Services
for Five Largest PACs

PAC #7: Diagnostic Investigation, **Class II**, Adult 17-t

Total Claims = 122,428

Total Number of Ancillary Codes Used = 1,134

HCPCS Code	Definition	Number of Ancillary Services
<hr/>		
71020	Radiologic exam, chest, 2 views	45,348
71010	Radiologic exam, chest, 1 view	15,700
85022	Hemogram automated and WBC count	11,908
81000	Routine urinalysis	11,840
73510	Radiologic exam, hip, complete	6,464
85028	Hemogram and platelet count	5,656
73030	Radiologic exam, shoulder, complete	5,650
82947	Glucose, except urine	5,466
72110	Radiologic exam, spine, complete	5,414
85007	Blood count, manual differential WBC count	5,182

PAC #16: Management of Class **III** Problem

Total Claims = 113.588

Total Number of Ancillary Codes Used = 993

HCPCS Code	Definition	Number of Ancillary Services
<hr/>		
81000	Routine urinalysis	12,925
85022	Hemogram automated and WBC count	7,914
82947	Glucose, except urine	6,802
80006	Automated multichannel test, 6	4,842
80007	Automated multichannel test, 7	3,827
80004	Automated multichannel test, 4	3,811
85021	Blood count, hemogram, automated	3,600
85028	Hemogram and platelet count	3,432
85610	Prothrombin time	3,392
85007	Blood count, manual differential WBC count	3,366

Table 5 (continued)
Page 2

PAC #8: Management of Class II Problem, Adult 17+

Total Claims = 112,429

Total Number of Ancillary Codes Used = 914

<u>HCPCS Code</u>	<u>Definition</u>	<u>Number of Ancillary Services</u>
85022	Hemogram automated and WBC count	6,608
81000	Routine urinalysis	6,063
82947	Glucose, except urine	3,825
85028	Hemogram and platelet count	2,996
80006	Automated multichannel test, 6	2,979
85007	Blood count. manual differential WBC count	2,829
85610	Prothrombin'time	2,607
85021	Blood count, hemogram, automated	2,566
80004	Automated multichannel test, 4	2,542
80007	Automated multichannel test, 7	2,398

PAC #15: Diagnostic Investigation of Class III Problem

Total Claims = 59,251

Total Number of Ancillary Codes Used = 1,153

<u>HCPCS Code</u>	<u>Definition</u>	<u>Number of Ancillary Services</u>
71020	Radiologic exam, chest, 2 views	20,461
71010	Radiologic exam, chest, 1 view	11,873
81000	Routine urinalysis	11,571
85022	Hemogram automated and WBC count	8,680
82947	Glucose, except urine	4,792
80006	Automated multichannel test, 6	4,460
80004	Automated multichannel test, 4	4,237
85028	Hemogram and platelet count	4,174
85007	Blood count, manual differential WBC count	3,935
74020	Radiologic exam, abdomen, complete	3,820

Table 5 (continued)
Page 3

PAC #24: Diagnostic Investigation with Nuclear or CT Scan

Total Claims = 21,113

Total Number of Ancillary Codes Used = 1,122

<u>HCPSC Code</u>	<u>Definition</u>	<u>Number of Ancillary Services</u>
71020	Radiologic exam, chest, 2 views	4,349
70450	Computerized axial tomography (CAT), head or brain, without contrast	3,743
70470	CAT, head or brain, without then with contrast	3,742
78306	Bone imaging, whole body	2,807
81000	Routine urinalysis	2,415
85022	Hemogram automated and WBC count	2,106
71010	Radiologic exam, chest, 1 view	1,819
74160	Computerized axial tomography, abdomen, with contrast	1,677
80019	Automated multichannel test, 19	1,248
70460	CAT, head or brain, with contrast	1,206

expected, PAC 24 is the only one with CT scans which dominate the top ten after the radiologic chest exam.

III. RESULTS

In addition to demonstrating that the PAC system can be applied to Medicare data, it is important to determine what its impact would be on hospital outpatient departments. would PACs classify patients similarly around the country? When the PAC system is applied to national Medicare data, how well does it explain the variance in payment for nonsurgical visits? And, finally, if we established a PAC payment system using average allowed charges at a national level, what would be the impact on hospitals in different locations and with different characteristics? The data adjustments necessary to conduct the analysis on these questions and the findings are presented in this section. We conclude this report with a discussion of the applicability of the PAC system to Medicare.

The results presented here consistently exclude end stage renal disease (ESRD) patients. In many cases these Medicare beneficiaries have unusual claims; for example, claims may be submitted for a month of dialysis services-bundling care to a greater degree than the PAC methodology intends. Moreover, the New York PAC system explicitly excludes ESRD patients. Results presented in Tables 1 through 3 include the ESRD patients and the distribution of the claims without these patients (Table 6) is very close to that when they are included (Table '3). The most important difference is the elimination of PACs 3 and 4 from the analysis. Since all the children on the file are ESRD patients, there are no claims for PACs 3 and 4 when ESRD patients are excluded. The ESRD exclusion reduces the overall file by 6,806 claims. Excluding these Medicare beneficiaries is most important when comparing the charge information, but for purposes of consistency, ail the tables that follow exclude ESRD patients.

THE DISTRIBUTION OF PAC GROUPS

After successfully running the PAC grouper, we first examined differences around the country in the distribution of PACs. Some of the variables describing hospital outpatient department characteristics used here come from the American Hospital Association (AHA) data for 1987 which were merged to our Medicare analysis file, and others come from the Medicare HCRIS file that includes information about disproportionate share and rural referral hospitals, for example. Merging these data allowed us to study hospital characteristics not otherwise available in the data. It also results, however, in some missing data in the various distributional tables when we were unable to match to AHA variables. The number of missing observations totalled 20,976.¹⁶

How Medicare PACs Compare to New York

Not all the differences in the PAC system between New York state's Medicaid program and our application to the Medicare data stem from having a national data base. For a number of reasons, we believed that looking at New York state alone would still result in differences in our data and in that from the New York program. And, indeed, that proved to be the case.

The PAC system as developed for New York state was designed to recognize differences in resources required to treat different patients in an ambulatory setting broader than just the hospital outpatient department. Consequently, both the expectations for the system and their actual results indicated that the management PACs would be much more commonly used than the diagnostic ones.

16. The AHA files do not contain Medicare provider IDs. Therefore, we must : upon a crosswalk between Medicare provider ID and AHA provider ID in ord to match Medicare claims to AHA data files. This crosswalk file is not routinely updated, and it is likely that many of the nonmatches are attributable to the exclusion of provider IDs from the crosswalk file.

New York's experience has been that the management **PACs** are indeed the more common and diagnostic **PACs** account for only about 10 percent of services to persons age 65 and older.

This experience is quite different from what we found with the Medicare data both overall (Table 6) and for New York's Medicare OPD patients (see Table 7). Medicare patients use a much larger proportion of diagnostic **PACs**—accounting for about 48 percent of all the classified Medicare claims. Why is this the case? A number of differences exist in our Medicare data as compared with that for New York state's program that might lead to a different distribution of **PACs**.

First, our Medicare data are restricted to clinics that are part of hospital outpatient departments or emergency rooms. In New York, freestanding clinics are part of the PAC system and such **clinics** are likely to have more patients with return visits and/or non-diagnostic visits. In addition, our site of service data vary from that of New York since we have included in our analysis emergency room services as well as hospital outpatient clinic visits. **Emergency** visits may result in more ancillary services being performed, although our own analysis and earlier work by Sulvetta suggested that there were not usually significant differences between OPD and emergency room visits.¹⁷

Second, the type of patients seen may influence the distribution of **PACs** as well. The system was, as noted above, designed to group all Medicaid patients. These clinics may devote fewer resources to these patients—even their over age 65 **patients**—than resources used by the average Medicare patient

17. Margaret Sulvetta, "Emergency Room Vs. Non-emergency Room Claims," Urban Institute Memorandum, July 11, 1988. We also examined the distribution of **PACs** after omitting emergency room services and found almost no differences.

Table 6

Medicare PAC Distributions After Trimming
and Excluding ESRD Patients

PAC #	Description	Percent of Claims
7	Diagnostic Investigation, Class II, Adult 17+	24.3
8	Management of Class II Problem, Adult 17+	22.3
16	Management of Class III Problem	22.1
15	Diagnostic Investigation of Class III Problem	11.6
24	Diagnostic Investigation with Nuclear or CT Scan	4.2
23	Speech and Rehabilitation Therapy	3.1
22	Opthamological Services	3.1
19	Management of Class IV Problem (with malignancies)	2.6
20	Management of Class V Problem (mental illness, substance abuse)	2.3
17	Diagnostic Investigation of Class IV Problem	1.3
18	Management of Chemotherapy and Radiotherapy Treatment	1.0
14	Management of Reproductive Problems	0.9
13	Diagnostic Investigation of Reproductive Problem	0.7
21	Audiological Testing	0.4
6	Annual Examination, Adult over 17	0.1
5	Medication Administration	0.1
12	Annual Gynecological Examination	*
11	Prenatal Revisits, Age 19-34	*
10	Prenatal Revisits, Age over 34 or under 19	*
4	Management of Class I Problem, Child 0-17	*
3	Diagnostic Investigation of Class I Problem, Child 0-17	*

* Rounds to less than 0.1%

n = 500,611

Table 7'
Medicare PAC Distribution by Location
(Excluding ESRD Claims)

PAC # and Description	Region				
	Northeast	South	North Central	West	New York State
7 Diagnostic Investigation, Class II, Adult 17+	23.5%	24.9%	24.4%	24.1%	24.2%
8 Management of Class II Problem, Adult 17+	22.5	22.2	20.6	24.9	19.4
16 Management of Class III Problem	20.8	23.1	21.7	22.3	20.2
15 Diagnostic Investigation of Class III Problem	10.7	12.5	12.2	10.3	12.7
24 Diagnostic Investigation with Nuclear or CT Scan	3.7	4.3	4.4	4.4	3.6
23 Speech and Rehabilitation Therapy	3.3	2.4	3.7	3.3	3.5
22 Opthamological Services	3.6	2.1	4.2	2.6	4.7
19 Management of Class IV Problem (with malignancies)	3.1	2.6	2.6	2.4	2.1
20 Management of Class V Problem (mental illness, substance abuse)	4.0	1.7	1.5	2.1	4.5
17 Diagnostic Investigation of Class IV Problem	1.4	1.4	1.4	1.0	1.4
18 Management of Chemotherapy and Radiotherapy Treatment	1.4	0.8	1.1	0.7	1.5
14 Management of Reproductive Problems	0.9	1.0	1.0	1.0	0.9
13 Diagnostic Investigation of Reproductive Problem	0.5	0.8	0.8	0.6	0.5
21 Audiological Testing	0.5	0.3	0.4	0.3	0.8
6 Annual Examination, Adult over 17	0.1	0.1	0.1	0.1	*
5 Medication Administration	0.1	*	•	0.1	*
12 Annual Gynecological Examination	•	•	•	•	*
11 Prenatal Revisits, Age 19-34	•	•	•	*	•
10 Prenatal Revisits, Age over 34 or under 19	•	*	•	*	*

• Rounds to less than 0.1%

in New York. Not only are the payment levels higher, but each additional test or service brings in additional revenue under the current Medicare system so it should not be surprising to see higher rates of use of ancillary services in all **PACs**. For example, the average PAC reimbursement rate in New York in 1990 for PAC diagnostic group 7 was \$161.79 as compared to the Medicare average combined payment amount in 1988 of \$192.53. **Even more dramatic**, PAC 16, an important management PAC group, was paid \$93.71 in New York but \$147.12 on average in Medicare in an earlier **year**.¹⁸

Finally, the quality of the Medicare data for use in establishing PAC groups may influence these findings. We have artificially created patient visits that resemble the bundled **PACs** and certainly there are potentially some incorrect groupings. As shown in Appendix A, we also calculated the distribution of **PACs** only for those cases (368,239 claims) where revenue trailer codes from the facility file indicated a physician visit. The results still indicate a much higher concentration of patients in diagnostic **PACs** as compared to New York. Since they deviate little from our larger sample, we continued to use that larger file.

However, any remaining data errors should not necessarily result in overstating the use of key technologies (which create the distinctions between management and diagnostic categories). The key technologies are carefully spelled out in the PAC software and that variable is available directly from the BMAD file. Thus, we do not believe that data problems represent a major reason for the high rate of diagnostic **PACs** in our Medicare data. Furthermore, the distribution of diagnosis and ancillary procedure codes across PAC groups

18. The New York figures come from New York Department of Health staff. The Medicare figures were calculated for this study and are reported in Table 8. These differences are discussed in more detail below.

appears consistent with the expected pattern. This tends to confirm that claims are generally categorized correctly, despite the existing data limitations.

Regional Variations

Patterns of medical treatment in the United States vary considerably by region of the country. These variations are likely to result in differences in the role that hospital outpatient departments play in providing medical services. If such services are more important in one region than another, the distribution of services by PAC might also vary. That is, if routine services are provided more consistently in OPDs in the West or the South, then those areas might show *greater concentrations in the management PACs. Or if those areas demonstrate more reliance on physician offices and ancillary equipment outside the hospital setting, other patterns might emerge.

Table 7 shows the distribution of PAC groups by region of the country. The distributions are quite stable. Both the ordinal ranking of PACs and the proportion within each group show few differences by region. The top five groups remain the same, although the ranking of PACs 16 and 8 switch places in the northeast and the west as compared to the overall average. In general, PACs in the northeast region are more likely to be of the management than the diagnostic type. That is, the percentage of cases falling in PACs 7 and 24 are less on average than for other areas of the country. Again, the differences are not very striking.

Urban/Rural Location

We also examined the distributions of PACs for various metropolitan statistical area size classifications. The same types of concerns about regional variation apply to urban vs. rural settings. Do rural hospitals serve

as a major source of high technology equipment for the community? Are patients in urban areas more likely to see their physicians in the OPD?

Here there were some larger distributional differences (Table 8). Class II problems (PACs 7 and 8) account for more claims in nonmetropolitan areas than elsewhere. In general these seem to be simpler problems than Class III, IV or V problems and include well care, non-specific conditions, ear, nose, throat, muscle/skeletal, respiratory and infections. In contrast, OPDs in very large metropolitan areas are somewhat more likely to include PACs for the more complex classes of problems and the PAC for ophthalmological clinic visits. Rural and smaller urban areas also show a slightly greater concentration of diagnostic as opposed to management PACs. CAT scans and MRIs (PAC 24) are most prevalent in small urban areas. This seems somewhat counterintuitive; perhaps this equipment is more available outside the hospital setting in urban areas.

Hospital Characteristics

Hospital bed size is used here as an indicator of the size of the institution to which the OPD is attached and Table 9 indicates variation in the distribution of PACs for hospitals ranked by bed size. Earlier research on hospital outpatient departments found that the characteristics of the hospital were important determinants of differences in outpatient costs and activities.¹⁹ OPDs in hospitals with more than 300 beds have a smaller proportion of diagnostic PACs than the overall average (44.1 vs. 48.9 percent). This seems counterintuitive since we often associate complicated cases being served at large hospital centers. On the other hand, if large facilities have very large outpatient departments and highly organized clinics, their clinics may also

19. John Holahan, Colin Flynn, and Margaret Sulvetta, "The Impact of Casemix on Outpatient Surgery Costs," Urban Institute Working Paper, 3725-01-01, September, 1988.

Table 8

Medicare PAC Distribution by Metropolitan Statistical Area
(Excluding ESRD Claims)

PAC # and Description	Metropolitan Statistical Area			
	Non-Metro- politan	Under 25,000	250,000- 1,000,000	1,000,000 and over
7 Diagnostic Investigation, Class II, Adult 17+	27.3%	25.4%	24.4%	21.8%
8 Management of Class II Problem, Adult 17+	23.6	23.2	22.1	21.2
16 Management of Class III Problem	20.3	20.3	22.0	23.8
15 Diagnostic Investigation of Class III Problem	12.5	11.3	11.2	11.2
24 Diagnostic Investigation with Nuclear or CT Scan	4.0	5.3	4.4	3.8
23 Speech and Rehabilitation Therapy	3.6	3.0	2.7	3.0
22 Opthamological Services	1.9	2.0	3.1	4.3
19 Management of Class IV Problem (with malignancies)	1.9	2.6	2.6	3.3
20 Management of Class V Problem (mental illness, substance abuse)	1.3	2.2	2.3	2.9
17 Diagnostic Investigation of Class IV Problem	1.0	1.6	1.5	1.4
18 Management of Chemotherapy and Radiotherapy Treatment	0.6	1.2	1.1	1.0
14 Management of Reproductive Problems	1.0	0.7	1.0	1.0
13 Diagnostic Investigation of Reproductive Problem	0.8	0.7	0.7	0.7
21 Audiological Testing	0.3	0.3	0.4	0.5
6 Annual Examination, Adult over 17	0.1	0.1	0.1	0.1
5 Medication Administration	0.1	0.1	*	0.1
12 Annual Gynecological Examination	*	•	•	•
11 Prenatal Revisits, Age 19-34	*	•	•	•
10 Prenatal Revisits, Age over 34 or under 19	•	•	•	•

* Rounds to less than 0.1%

Table 9
Medicare PAC Distribution by Hospital Bed Size
(Excluding ESRD **claims**)

PAC # and Description	Hospital Bed Size				
	Less Than 50	50-99	100-199	200-299	Greater Than 300
7 Diagnostic Investigation, Class II, Adult 17+	26.3%	27.7%	26.6%	25.4%	21.3%
8 Management of Class II Problem, Adult 17+	25.2	23.6	23.9	22.6	20.5
16 Management of Class III Problem	21.7	20.3	19.9	21.4	24.0
15 Diagnostic Investigation of Class III Problem	11.9	12.1	11.7	11.7	11.5
24 Diagnostic Investigation with Nuclear or CT Scan	2.8	3.5	4.2	4.1	4.4
23 Speech and Rehabilitation Therapy	3.8	4.2	3.4	3.0	2.6
22 Gpthamological Services	1.7	2.0	2.8	2.5	4.0
19 Management of Class IV Problem (with malignancies)	1.8	1.9	2.0	2.4	3.5
20 Management of Class V Problem (mental illness, substance abuse)	1.3	1.4	1.7	1.9	3.1
17 Diagnostic Investigation of Class IV Problem	0.8	0.9	1.0	1.2	1.8
18 Management of Chemotherapy and Radiotherapy Treatment	0.4	0.5	0.8	1.1	1.2
14 Management of Reproductive Problems	1.2	1.0	0.8	0.9	1.0
13 Diagnostic Investigation of Reproductive Problem	0.7	0.7	0.7	0.7	0.7
21 Audiological Testing	0.3	0.3	0.4	0.3	0.4
6 Annual Examination, Adult over 17	0.1	0.1	0.1	0.1	0.1
5 Medication Administration	•	•	0.1	0.1	0.1
12 Annual Gynecological Examination	•	•	•	•	•
11 Prenatal Revisits, Age 19-34	—	•	•	•	•
10 Prenatal Revisits, Age over 34 or under 19	•	•	•	•	•

• Rounds to less than 0.1%

treat proportionately more patients receiving routine services than smaller facilities. That is, their high technology ancillary departments may be important in absolute numbers, but relatively small when a large patient population is averaged in. Also, as indicated above, large hospitals in large metropolitan areas may be competing with freestanding facilities that offer these ancillary services.

These larger institutions also tend to have a slightly more diffuse distribution of PAC groups. That is, the top four PAC categories account for 77.3 percent of all claims in hospitals with more than 300 beds as compared to 80.2 percent across all hospitals. Not surprisingly, hospitals with less than 100 beds are less likely to offer CT scans or MRIs to their patients (PAC 24). These smaller facilities also have a greater concentration of the less complicated Class.11 problems (PACs 7 and 8).

Altogether, these results are most notable for the stability in the patterns of PAC distributions. The classification system seems to hold consistently around the country and by location of the hospital. Differences that exist generally seem to be reasonable ones aside from some of the urban/rural differences, which are never very large.

AVERAGE COMBINED PAYMENTS

A first look at the means of total combined payments by PAC indicates that within each patient class, the diagnostic PACs generally constitute substantially higher cost claims than the management PACs (see Table 10). As defined above, these combined payments include the facility costs (calculated by multiplying the reported charges by the facility's average cost-to-charge ratio) and all allowed charges from the BMAD file for the visit (which

Table 10
Mean Medicare Combined Payments by PAC Group
(Excluding ESRD Claims)

Patient Classes	Diagnostic Investigation	Therapies	Problem Management	Well Care
Class II	PAC #7 \$192.53 (0.71)		PAC #8 \$121.33 (0.97)	PAC #6 \$123.14 (0.95)
Pregnant Women	PAC #9		PAC #10 \$161.82* (0.95)	PAC #11 \$156.81* (1.04)
Reproductive Care	PAC #13 \$163.44 (0.61)		PAC #14 \$89.50 (0.81)	PAC #12 \$87.87* (0.92)
Class III	PAC #15 \$259.30 (0.74)		PAC #16 \$147.12 (1.06)	
Class IV	PAC #17 \$260.27 (1.07)	PAC #18 \$593.65 (1.20)	PAC #19 \$163.36 (1.28)	
Class V		PAC #20 \$112.41 (1.01)		
Any Patient	PAC #24 \$561.47 (0.51)	PAC #5 \$112.53 (1.22)		
Speech and Rehabilitation	PAC #21 \$162.95 (0.85)	PAC #23 \$215.59 (0.96)		
Ophthalmology	PAC #22 \$146.46 (0.98)			

Note: Numbers in parentheses are coefficients of variation.

* Those means are calculated from a sample size of less than 90 claims.

may include several ancillaries and procedures). If these combined payments accurately reflect resource use, then the PAC system does seem to achieve its goal of distinguishing between visits that require “more extensive resources required to care for more complex problems” and less routine management of care.

Note the four largest **PACs**: 7, 8, 15 and 16. **PACs** 7 and 8 both fall in Class II, but total payments for all the claims grouped in PAC 7, diagnostic investigations, are 59 percent higher than claims in PAC 8 (\$192.53 compared to \$121.33). For Class III, the average combined payment for the diagnostic PAC (15) is 76 percent higher than for management services in that Class (PAC 16). The main difference between the management and diagnostic categories is the presence of at least one key technology in the diagnostic PAC and this rule does seem to differentiate substantially level of resource use. However, as compared to New York, the differential is less between management and diagnostic **PACs** across the same patient classes. For the above groups, New York State pays the diagnostic **PACs** about twice as much as payments for the management **PACs**.²⁰

The coefficients of variation for the combined payments within each PAC range from 0.51 in PAC 24 to 1.28 in PAC 19. Seven **PACs** have **CVs** greater than 1. Coefficients of variation of 1 and above indicate considerable dispersion of charges within each category. Thus, although the **PACs** do seem to appropriately differentiate by the means, there is substantial variation within each PAC suggesting that these groups may overlap. Our management **PACs** seem to include more ancillary services than is the case in New York State.

20. New York State Medicaid rates obtained from New York State Department of Health .

GLM RESULTS

One measure of the effectiveness of a reimbursement system is how well it minimizes variations in resource use within the payment groups. That is, does the grouping system combine claims that require similar amounts of resources?

In a well-designed system, the variation in resource use should be greater across groups than within groups, and the system should attempt to maximize the explained variance in resource use. That is, the payment system should group together claims that require similar levels of resources so that providers can be fairly compensated.

As described above, we know that the coefficients of variation are relatively high within some of the PAC groups as measured by the combined payment amounts. It is thus important to more formally test whether the groupings account for a substantial share of the variation in combined payments.

To investigate this area quantitatively, we use a specific analysis of variance technique called General Linear Model (GLM). The GLM procedure is used rather than standard analysis of variance because the PAC groups under study are of very uneven size. GLM is specifically designed to work with unbalanced groups. This procedure estimates the overall explained variance attributable to PACs and statistically tests the differences in means across the groups.

GLM was applied to the data using both the total combined payments and facility costs only, as shown in Table 11. Moreover, we present results for a number of different groupings both before and after trimming in order to put the analysis in context.

Table 11
General Linear Model Findings for PAC System

Type of Grouping or Composition of PAC Sample	R2	
	Total Combined Payments	Facility costs Only
Data Before Trimming		
Principal Diagnosis as Defined by PAC ^a	0.124	
Grouping by Body System	0.028	
PAC	0.108	0.078
Data After Trimming		
Principal Diagnosis as Defined by PAC ^a	0.126,	
Grouping by Body System	0.043	
PAC	0.237	0.177
PAC Excluding ESRD	0.245	0.183
PAC Excluding ESRD and Questionable Visit Codes ^b	0.274	0.217

- a. Analysis used ANOVA routine since it included too many groups for GLM.
- b. The visits excluded from this version were constructed using BMAD data to identify physician visit.

In addition to the PAC grouping, we calculated the explained variance for two other data groups for total combined Medicare payments. The first, principal diagnosis, included 5,624 ICD-9 codes that represent the principal diagnosis from each claim. This very disaggregated grouping yields a low R^2 of 0.124 before trimming the data and 0.126 afterwards.

An even lower R^2 is achieved if we group the data by body system. These 25 categories were defined for the PAC system and are called diagnostic service categories (DSCs). They differ from the basic categories used in the hospital prospective payment system, instead capturing "body systems and multisystem diagnoses modified by customary ambulatory service patterns." An example of a DSC is well baby care.²¹ These groups are further collapsed to yield the classes that make up the PACs. These clinically meaningful categories do not do very well at explaining the variation in total combined payments, however.

The PAC categories perform substantially better than either of these building blocks. The R^2 s are 0.108 before trimming and 0.237 after trimming when using the full sample. Although the PAC has fewer groups (effectively 21 for our analysis), it does better in explaining the overall variance. Why is this likely the case? The PAC system goes beyond the clinically meaningful classifications to explicitly combine categories where resource use is similar. And probably more important, the PAC system then splits these patient classes into management and diagnostic categories with the intention of distinguishing between visits requiring a substantial resource input and less resource-intensive visits.

The comparison across these three groups is also instructive in another way. The low R^2 s for principal diagnosis and body system suggest that any

21. Tenan et al., op cit., p.44.

reimbursement system for medical visits will likely have relatively low R^2 s for these data. This is further underscored by the findings in an evaluation of an alternative payment system, Ambulatory Patient Groups (APGs). Although the overall R^2 s obtained for this evaluation are higher, when only medical visits are examined, the results are much closer. The APG evaluation found R^2 s for medical visits of 0.18 for untrimmed and 0.38 for trimmed data.²² APGs include 80 payment groups for medical visits, 43 for laboratory and radiology, and an additional 15 for ancillary tests and procedures.

Also shown in Table 9 are results for PACs when End Stage Renal Disease (ESRD) patients are excluded. The R^2 rises to 0.245. As discussed above, PACs were initially designed excluding ESRD patients, so it is certainly appropriate to use this figure.

Finally, we also estimated GLM results for our data excluding those visits in which we needed to supplement OPD information with data from the BMAD file to determine whether the claim qualified as a PAC visit. Although in general we believe these data ought to be included in our analysis, excluding them does raise the R^2 to 0.274, a substantial improvement.

The PAC system combines facility costs and allowed charges for physicians and ancillary services. But Medicare, which pays physicians separately and is moving to a new physician fee schedule, might want to consider whether the PAC groupings are appropriate as a payment for facility charges only. Consequently, results from the GLM are shown in the second column of Table 11. They do less well at explaining the variation in costs. Here the R^2 is 0.177 for the full file and rises to 0.217 when ESRD and any potentially questionable

22. Richard Averill et al., "Design and Evaluation of a Prospective Payment System for Ambulatory Care," Final Report to Health Care Financing Administration, 3M Health Information Systems, December 31, 1990.

data are excluded. The system works better in explaining variation for the combined payments than it does for facility costs alone.

Although these relatively low R^2 s indicate that the PAC system using these Medicare data does not explain a substantial portion of the variance in payment as exists under the current system, it seems to do nearly as well as a more complicated 80–138 category system (APGs). Unlike the APG system, PACs assign one PAC group per visit. The APG system assigns a separate APG group to each procedure on the claim. A single PAC group can include medical procedures, radiology procedures, and laboratory procedures. Thus, a priori, we would expect PACs to exhibit lower explained variance, since each PAC group categorizes a more heterogeneous group of services. Given the smaller number of groups in the system and the broader bundle of services included in each group, the level of charge variance explained by the PAC system is well within the range of acceptability.

Nonetheless, further adjustments would be necessary in order to ensure that hospital outpatient departments were reasonably compensated for their actual resource use. These findings should, however, be tempered with several important caveats. First, our simple example uses estimates of current payment levels that may not accurately reflect resource use. New York's PAC system was developed after directly estimating resource use, for example. Further, for simplicity we have used a single average payment based on national data. Some of the variance within PACs undoubtedly reflects regional and urban/rural differences in wages that might be incorporated in an actual prospective payment system. This may also affect the proportion of explained variance.

WINNERS AND LOSERS UNDER A NATIONAL PAC SYSTEM

If the PAC system were implemented using the mean national total combined payments as the payment schedule for each PAC, hospital outpatient departments would vary substantially in terms of who would gain and who would lose.²³ Since all claims in each PAC would be paid the same, hospitals with higher than average combined payments under the current system would be "losers" and those outpatient departments where payments are now lower than the national average within each PAC would be "winners." The goal of a payment system such as the PAC system is to reasonably compensate providers for their services. Losers and winners would likely arise under any system; more efficient providers ought to fare well under such a system and should be compensated above their average combined payments, for example. On the other hand, if large numbers of hospitals are either substantial winners or losers and if those variations have little to do with efficiency, a payment system will be viewed as unfair and result in burdens on providers and beneficiaries alike. Across large groups of hospitals, the winners and losers ought to balance out under a well-designed system after accounting for legitimate differences.

For simplicity, this analysis looks only at a national payment system. However, since urban/rural and regional differences now exist in payment rates, we expect to see an uneven distribution of winners and losers. Indeed, the findings of urban/rural and regional winners and losers may tell us more about the adjustments that would be necessary in a Medicare payment schedule than about true "winners and losers." Thus, these differences might be accommodated

23. This assumes a fully uniform system such as for Medicare hospital inpatient payments. The PAC system in New York, on the other hand, retains a facility component.

under a system that allowed other wage adjustments or separate regional or urban/rural payment rates.

Table 12 looks at the variation in average payments by location of the hospital: **both** region and size of the metropolitan statistical area. The combined payment level in the table is the average per claim for hospitals with those characteristics; these figures are the estimated "total combined payment" amount that includes the physician allowed charges and the OPD facility charge adjusted by the cost-to-charge ratio. The PAC payment figure shown in the second column is calculated by using the national average combined payment amount for all claims in that PAC as the PAC payment for each group. As a result, there is a single national payment rate for each PAC group. Thus, any observed differences in PAC payments across hospital characteristics are attributable to variation in the distribution of PAC groups. That these areas all show relatively small differences in the **PAC** payment levels indicates again ~~the~~ uniformity in the distribution of PAC groups across hospitals.

The gain or loss for hospitals with given characteristics represents the difference between these two payment averages. Gainers would receive a higher payment under a national PAC payment system. Sharp differences exist between gainers and losers by hospital location. Northeast hospitals would gain by almost \$11 for each claim-or about a 6.1 percent increase in payment levels. In contrast, hospitals in the West would lose more than \$31 per claim, a 14.4 percent decline.

Not surprisingly, when looking at urban/rural differences, the **non-**metropolitan statistical area hospitals would gain the most from **PACs**, increasing their payments by about \$17 on average. Hospitals in metropolitan statistical areas with populations of more than a million would lose \$13.68 per

Table 12

Impact of PAC Payment System by Hospital Location
(Excluding ESRD Claims)

	Average Per Visit		
	Combined Payment	PAC Payment	Gain or Loss
Region			
Northeast	\$176.98	\$187.82	\$10.84
south	179.77	190.50	10.73
North Central	195.71	193.28	-2.43
West	218.14	186.71	-31.43
Metropolitan Statistical Area			
Non-Metropolitan	172.08	189.15	17.07
Under 250,000	197.10	195.95	-1.15
250,000-1,000,000	186.31	191.63	5.32
1,000,000 +	200.88	187.20	-13.68
All Visits	189.95	189.95	—

claim. Regional or urban/rural differential adjustments in payment rates or facility-based component would undoubtedly mitigate these differences.

Hospital characteristics and their impacts on whether hospitals are gainers or losers are summarized in Table 13. Hospitals with smaller bed sizes—generally an indication of the size of the outpatient-department—are gainers. The pattern is consistent across bed size, with gains turning to losses as bed size increases. In addition, sole community, disproportionate share and rural referral hospitals all would show substantial gains under this national PAC system. Again, the PAC payments would be relatively uniform across all these categories (with the exception of rural referral hospitals). It is the current variation in combined payments that leads to the spread in winners and losers rather than any major differences in the distribution of PACs across groups.

To explore the relationship between location and bed size further, Tables 14 and 15 show the distribution of gainers and losers by bed size within each region and within each metropolitan statistical area size category. Here some further interesting patterns emerge. The findings on bed size where smaller hospitals have greater gains remain reasonably consistent by region, although some of the differences are mitigated. For example, in the South, the trend is slightly reversed for medium-sized hospitals. Hospitals with 200 to 299 beds gain slightly more than smaller 100 to 199 bed hospitals. In the West, the three largest groupings of hospitals by bed size show similar average losses. The importance of viewing these findings on bed size after controlling for regional differences suggests that even if regional payment adjustments were made, there would still be substantial gainers and losers.

The combination of metropolitan statistical area and hospital bed size shows some considerable deviation in the bed size patterns (Table 13). Within

Table 13

Impact of PAC Payment System by Hospital Characteristics
(Excluding ESRD Claims)

	Average Per Visit		
	Combined Payment	PAC Payment	Gain or Loss
Bed Size			
Under 50 beds	\$164.39	\$181.81	\$17.42
50-99	177.62	187.01	9.39
100-199	189.78	189.86	0.08
200-299	193.77	192.89	-0.88
300 and above	194.35	190.71	-3.64
Sole Community			
No	190.13	189.97	-0.16
Yes	183.97	189.26	5.29
Disproportionate Share			
No	195.62	192.78	-2.84
Yes	179.03	184.50	5.47
Rural Referral			
No	190.19	189.62	-0.57
Yes	184.01	197.83	13.82

Table 14

Impact of PAC Payment System by Region and Hospital Bed Size
(Excluding ESRD Claims)

	Average Per Visit		
	Combined Payment	PAC Payment	Gain or Loss
Northeast			
Under 50 beds	\$136.55	\$176.37	\$39.82
50-99	150.54	181.56	31.02
100-199	170.34	186.40	16.06
200-299	183.30	191.80	8.50
300 and above	183.22	-187.95	4.73
South			
Under 50 beds	152.18	177.80	25.62
SO-99	170.41	184.92	14.51
100-199	179.14	189.93	10.79
200-299	179.18	193.15	13.97
300 and above	189.02	193.91	4.89
North Central			
Under 50 beds	164.00	187.45	23.45
SO-99	183.83	193.04	9.21
100-199	201.45	195.45	-6.00
200-299	206.15	196.15	-10.00
300 and above	198.48	192.49	-5.99
West			
Under 50 beds	201.06	182.66	-18.40
SO-99	206.46	186.81	-19.65
100-199	221.31	188.38	-32.93
200-299	224.66	189.65	-35.01
300 and above	220.53	184.44	-36.09

Table 15

Impact of PAC Payment System by Metropolitan
Area and Hospital Bed Size
(Excluding ESRD Claims)

	Average Per Visit		
	Combined Payment	PAC Payment	Gain or Loss
Non-Metropolitan			
Under 50 beds	\$160.67	\$182.41	\$21.74
50-99	172.45	187.00	14.55
100-199	173.53	191.59	18.06
200-299	179.50	195.50	16.00
300 and above	183.87	203.67	19.80
Under 250,000			
Under 50 beds	165.43	175.08	9.65
50-99	181.89	193.97	12.08
100-199 200-299	206.11	190.85	-15.26
	195.88	198.07	2.19
300 and above	198.57	199.25	0.68
250,000 to 1,000,000			
Under 50 beds	189.77	182.41	-7.36
50-99	172.25	184.42	12.17
100-199	178.28	187.93	9.65
200-299	183.11	191.47	8.36
300 and above	192.31	194.28	1.97
1,000,000 +			
Under 50 beds	190.41	181.30	-9.11
50-99	205.60	186.70	-18.90
100-199	213.08	188.48	-24.60
200-299	206.52	190.35	-16.17
300 and above	195.24	185.83	-9.14

each metropolitan statistical area, the largest hospitals are not the largest (relative) losers. And in metropolitan areas with 250,000 to 1,000,000 people, the smallest hospitals are the only group to lose on average. Part of this may reflect sample size problems. For example, only 1920 claims out of the total of over half a million claims are for hospitals of less than 50 beds in a metropolitan area with a population between 250,000 and 1,000,000.

Nonetheless, even when the number of claims used to calculate the averages is very large (e.g., large hospitals in large metropolitan areas or small hospitals in less populated areas), the results suggest that looking only at size of the hospital or size of the metropolitan area exaggerates the trends. Because the two factors (bed size and urban density) generally move together, looking at only one captures the influence of both. Thus, both factors influence the gains and losses but neither is as important as it first appears.

From a different perspective, if we view Table 15 as a means for controlling for differences in locations of the hospital, the gains and losses by bed size within each metropolitan area take on more significance, for they tell us about gains and losses that might remain even after urban/rural differentials are established.

CONCLUSIONS ON THE APPLICABILITY OF PACs TO MEDICARE

Could the PAC system be used with Medicare? And if so, what would be the advantages and disadvantages? How well does the PAC system meet basic criteria for a well-designed payment system?

Five criteria can be applied to an analysis of the PAC system: administrative simplicity, appropriateness, reduction in variance, stability, and the absence of undesirable provider incentives. Each of these are examined

below. The last two criteria are only briefly discussed, however, since the evaluation of the actual workings of the PAC, being conducted by Abt, will deal with these issues in more detail.

Administrative Simplicity

One major problem with the PAC system is that its philosophy and application are quite different than that of the Medicare system. Thus, a number of important adjustments would be necessary to adapt the PAC system to Medicare. First, the PAC system bundles both the facility and the professional payments in clinic and outpatient settings into one of 24 payment amounts. Medicare, on the other hand, pays these two different components separately; the bills are submitted by different parties, the rules vary substantially, and even the data sets summarizing these payments are fully separate. Discussions of a Medicare prospective payment for hospital outpatient departments generally envision only a facility payment. Physician and other professional payments would presumably be channeled through the new Medicare relative **value fee** schedules about to be implemented. While our analysis indicates that the data could be manipulated to create a combined claim, a number of hurdles would need to be met before such a system could be implemented in Medicare.

Another element of the PAC system that makes it quite different than the changes envisioned for Medicare is the way in which payments are established under the PAC system. In addition to the standard payment for physician and ancillary services, a facility-specific add-on is also part of each **payment**.²⁴ The facility-specific payment, which is about half of the total, is based on historical costs subject to certain statewide cost limits. Thus, the PAC

24. New York is currently investigating the feasibility of moving from a facility-specific add-on to a more standardized rate, with the exception of capital.

system builds in more variation from one standard payment than we have allowed in this analysis. It is, however, very consistent with how hospital DRGs were implemented.

Thus, while the PAC system does not require a great deal of data and seems manageable by facilities, that simplicity could not be automatically transferred to Medicare. Once in place, however, it would be a simple, readily understood system.

Appropriateness

An appropriate system will group patients into categories that are meaningful for Medicare beneficiaries. It should not result in lopsided categories that either have a large share of all beneficiaries or almost none. In addition, a system should not incorrectly group patients. Finally, there should not be systematic failings of the system to group patients.

The PAC system does successfully group Medicare patients into its groups. Patients were not, for example, systematically excluded so long as they represented physician visits to the hospital outpatient department. Another aspect of appropriateness does relate, however, to the issue of referred ancillaries. These services were not designed to be covered by the PAC system. Since our findings indicate that these comprise a large share of Medicare claims to the OPD, the PAC system is less comprehensive than one that would include ancillary-only visits.

Perhaps of most concern, the PAC system was designed for patients of all age groups, rendering several of the PAC groupings either irrelevant for Medicare or of very small size. In particular, the prenatal PACs and those aimed at children under the age of 18 would be seldom, if ever, used by Medicare beneficiaries. Routine examinations and well care are excluded from

coverage by Medicare. This effectively reduces the number of groups to 14. A large proportion of elderly patients fall into Classes II and III of the PAC grouping system, and even more significantly, they are much more likely to be grouped in the diagnostic categories, accounting for a far greater emphasis on such PACs than was envisioned in the New York system. Thus, some other PACs may be used too intensively to distinguish well the resources necessary to treat these patients. Thus, the PAC system would require some further modification if it were to be applied to the Medicare population.

Reductions in Variance

The most problematic finding from our analysis is the small amount of the variation in total combined payments that the PAC system explains for the Medicare data. And as mentioned above, these findings are at odds with the amount of variation explained when the system was tested on patients of all ages in New York. A major clue seems to be the high payment levels associated with the management PACs in Medicare's data. Use of key technologies as a proxy for heavy ancillary service use may not be as appropriate for distinguishing between the management and diagnosis categories for the Medicare population as for New York's Medicaid patients.

Some of this difference could also be attributed to problems with our data; as indicated in Section II, we had to make a number of assumptions about the episode of care to create our merged data base. But in general, the assumptions we made should not systematically bias downward the results. It seems that the direction of any bias is likely to be in capturing only part of an episode of care, reducing the potential variation in overall allowed charges. For example, if we inadvertently lose some ancillary tests performed after the initial visit, we will understate the very complicated claims that

are likely to also use substantial resources. Another potential problem is that we may incorrectly treat as OPD visits instances where a physician in the community orders a test that is performed the same day in the OPD. Since same day visits of this sort are likely to involve simpler tests, again the bias is likely to be in the direction of lower resource use. Yet, we know from our findings that a major source of difference with New York is in the disproportionate share of diagnostic **PACs** that characterize the Medicare data. Furthermore, while the limited level of cost variation explained by the PAC system is of concern, it is also highly likely that the PAC system results are within the realm of reasonable expectations. When the basic building block of a medical grouping system (**ICD-9** diagnosis codes) is used, it explains less cost variation than the PAC system does.

Stability and Provider Incentives

A stable payment system should be one in which it is not easy to "game" the system to shift from group to group. Moreover, the system should not create incentives for undesirable provider behavior. How well the PAC system operates in practice is being evaluated elsewhere.²⁵ But, it is also possible to discuss the potential for such gaming and incentives.

Perhaps the most problematic issue rests with whether providers will find it in their interest to undertake a key technology to move patients from the management to the diagnostic category within a given class of service. Since payments are higher for the diagnostic group, it may pay to choose a relatively inexpensive key technology and routinely provide it to patients. Our data

25. Lois Olinger, "Evaluation of the New York State PAC Project: Case Study of PACs Implementation," Abt Associates, Inc., November 1990.

indicate that Medicare users already are more likely than New York's patients to have such tests.

One issue raised early in this study was whether the PAC system would create incentives for shifting the site of care. This has traditionally been expressed in terms of inpatient to outpatient shifts. It is possible that a prospective payment system such as that proposed here would create some incentives, but the more likely shifts would occur across ambulatory settings. Take for example the case of "referred ancillaries." As noted above, the PAC system does not include such OPD activities in its payment structure. If these continued to be reimbursed on a cost basis, hospital outpatient departments might face very different incentives depending upon whether the PAC payments are relatively generous as compared to the costs they could be reimbursed for from referred ancillaries.. These incentives might affect the size of their clinics over time and their willingness to accept (or encourage) referred ancillaries. Similarly, physicians choosing how to split their time across different settings may be strongly influenced by such a system if it includes their payments as well as the facility costs.

Thus, a bundled payment system for outpatient services may offer many advantages in giving Medicare more control over the volume of services. But if it is applied to only one setting such as the hospital outpatient department it may create new and perhaps undesirable incentives for shifting the way that ambulatory care is delivered in the United States. At the least, payment levels'would need to be carefully coordinated. Resolving some of the inpatient to outpatient incentives by adopting prospective payments for OPDs may open new areas of payment-based incentives for behavioral change.

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Appendix A

Medicare PAC Distribution After Trimming and
Excluding **ESRD** Patients, Limited to Claims
Classified by Revenue Center **Codes^a**

PAC #	Description	Percent of Claims
7	Diagnostic Investigation, Class II, Adult 17+	22.9
a	Management of Class I+ Problem, Adult 17+	24.9
16	Management of Class III Problem	23.6
15	Diagnostic Investigation of Class III Problem	11.0
24	Diagnosstic Investigation with Nuclear or CT Scan	2.6
23	Speech and Rehabilitation Therapy	2.0
22	Ophthalmological Services	3.4
19	Management of Class IV Problem ('with malignancies')	2.4
20	Management of Class V Problem (mental ill., substance abuse)	2.6
17	Diagnostic Investigation of Class IV Problem	0.9
1a	Management of Chemotherapy and Radiotherapy Treatment	0.5
14	Management of Reproductive Problems	1.1
13	Diagnostic Investigation of Reproductive Problem	0.3
21	Audiological Testing	0.3
6	Annual Examination, Adult over 17	0.1
5	Medication Administration	0.1
12	Annual Gynecological Examination	*
11	Prenatal Revisits, Age 19-34	*
10	Prenatal Revisits, Age over 34 or under 19	*

a. This distribution excludes those claims (except 21,22, and 23) where a HCPCS code was used to identify the clinic visit.

* Rounds to less than 0.1 percent.

n = 362,840

APPENDIX 4

According to an article written by staff from the New York State Department of Health¹, some of their **findings** appear to differ from the results reported in our final report **evaluating** the **PACs** demonstration project². **Specifically**, two areas of study appear to be in conflict:

- **Key Techs:** NYS found that there was no change in the use of key tech **PACs** in health centers, but noted some change in hospitals. The Abt study concluded that key **techs** increased substantially in both types of facilities.
- **Type of Provider:** NYS found that in hospitals, there was decrease in the use of general practice physicians and an increase in the use of residents. They also found that, across all hospitals, the percentage of specialist physicians remained constant. On the other hand, in community health centers, NYS found that there was an increase in general practice physicians and a decrease in residents. The Abt study, on the other hand, found that primary care physicians assumed a larger role across all facilities and that the use of specialist physicians decreased significantly across all facilities.

There are several factors that may explain the differences in the findings between the two studies:

¹ Fillmore, H. and DeNyse, W., "Packaging Outpatient Services: The PACs Demonstration Experience", *Journal of Ambulatory Care Management*, 16(3), pgs. 71-83, 1993

² Noether, M. and Olinger, L., Evaluation of the New York State PACs Project: Final Synthesis Report, Under HCFA Contract No. 500-87-0030(3). July 1992.

Data Sets: The data sets used by NYS and Abt Associates are quite different.

- NYS used Medicaid billing data, combined with a special **evaluation dataset** which included information on patients, clinical staff, contact time, and ancillaries for each visit on *all patients* from 15 of the 17 participating demonstration facilities from 1988 to 1991, representing over 2.7 million records.
- The Abt study, on the other hand, relied on a **stratified random sample** from the **evaluation dataset** only, which included a sample of records on *all payers* for 13 of the 17 participating demonstration facilities from August 1987 to 1990, representing approximately 58,000 visits.

It is difficult to assess how these differences in data sets used by both studies would affect the results. However, it is important to note that while the Abt study examined data for all payers, the patterns found for all payers was also **found** for Medicaid patients as well.

Study Periods: The time periods under study by NYS and Abt Associates are different; and the NYS defined the “pre-period” and “post-period” differently than Abt Associates.

- NYS defined the “pre-period” as the *first 6 months* of each facility’s enrollment in the demonstration; the remaining *time through 1991 was defined* as the “post period”.
- The Abt study defined the “pre-period” as 1-2 months *before* the facility enrolled in the demonstration (between August 1987 and March 1988); the “post-period” represented from 1-2 years *after* the facility enrolled in the demonstration, *with* the latest data *through March 1990*.

Particularly the difference in the definition of the pre-period may explain many of the differences in findings. The Abt study focuses on a true “pre- vs. post-” comparison, whereas the NYS study examines the facilities’ learning experience under PACs (and ignores their experience prior to the PACs system).

Key Tech PACs: The analysis on the use of key technologies³ focused on different PAC groups.

- NYS examined key technology use by examining visits in 6 **PAC groups**, representing only those PAC groups which required the presence of the key technology for assignment into a “key tech” PAC.⁴

³ Key technologies include nuclear imaging, ultrasound, radiographs, contrast imaging, and CATSCANS.

⁴ These PACs include: PAC 3, PAC 7, PAC 13, PAC 15, PAC 17, and PAC 24.

- The Abt study examined key technology use as defined by the particular service used across *all 24 PAC groups*, including those PAC groups where the presence of a key technology does not affect PAC assignment.⁵

As a result of this difference in the definition of a key technology, the two *analyses* addressed different questions.. The NYS study addressed *the issue*: “What is the impact of the PAC system on the number of visits *billed in the six* key tech *PACs*?”, while the Abt study focused on “What is the impact of the PAC system on the *utilization* of key technologies, regardless of what PAC group the visit is classified in?” The *overall* utilization of key tech services measured by Abt is much larger because of its broader focus; in particular, in a substantial number of pre-natal visits, an ultrasound is provided which is not measured in the NYS evaluation.

Provider Classification: The Abt and **NYS** studies classified provider specialties differently.

- *NYS excluded residents* from the general practitioner classification, and treated them as a separate provider category.⁶
- The Abt study *included residents in* the primary care physician classification.⁷

The Abt study did not examine the use of residents specifically. However, given the inclusion of residents in the primary care physician category, it is not surprising that the Abt study found a significant increase in the use of primary care physicians across all facilities. In fact, this finding is consistent with NYS’ conclusion that the use of residents increased.

These differences in evaluation data sets and variable definitions, combined with the fact that, in many respects, the NYS and Abt studies were examining different research questions, makes it difficult to compare the results from each study. However, when the definitional and methodological differences are understood, there do not appear to be inconsistencies in the conclusions of the two evaluations.

⁵ For example, the provision of ultrasound for prenatal care (PACs 9, 10, or 11) does not affect PAC assignment for the visit.

⁶ NYS used four different classification types for provider: general practice physicians, physician specialists, residents, and all other provider types (e.g., nurses and therapists).

⁷ The Abt study used three different classification types for provider: primary care physician, specialist physician, and non-physician.